Pests

AND THEIR CONTROL

1946
SEPTEMBER
VOL. 14, NO. 9

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

7

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TARPAULIN FUMIGATION

Yes, tarpaulins are again available, and the jobs which need to be done with them are awaiting the progressive fumigator in every city of any size in the United States.

Food processors, seedsmen, feed dealers and warehousemen are your customers. They receive infested material with great regularity these days. More often than not, they are miles away from a fumigation chamber or satisfactory building in which a thorough fumigation can be done. Here is how you can help them save their commodities and profitably broaden your scope of operations in the sanitation field.

EQUIPMENT: One 25' x 25' or 30' x 30' plastic coated tarpaulin, one-pound cans of methyl bromide, a Jiffy applicator with tubing attached, some elongated canvas bags filled with sand which are called "canvas snakes", or any bagged material which is handy, a good broom and a supply of any good caulking compound for sealing floor cracks.

PROCEDURE: If possible, arrange material in a square stack whether it is bagged or packaged, at a height of five or six feet so that the tarpaulin will cover it completely. Allow a marginal excess of at least two feet so that the edges can be sealed with the snakes or extra bags. Build a gas expansion dome by placing five or six cartons or sacks upright in the center of the stack. Locate the open end of the applicator among these sacks and hold it in place by means of one of the bags in the top layer. Be sure that the tube is placed so that no liquid methyl bromide comes in contact with the tarpaulin; otherwise, the plastic coating may be damaged or washed away completely. Sweep the floor clean immediately around the stack. Now cover with the tarp and arrange the tubing so that it comes out at a fold near the corner. Place your bags or snakes all along the margins so as to seal the tarpaulin next to the floor. Do not try to use lengths of lumber since they will not follow indentations or depressions in the floor surface and would allow excessive leakage.

DOSAGE: By measuring the overall dimensions of the stack, obtain as close an estimate as possible of the number of cubic feet under the tarp. For each 1000 cubic feet, release 1½ pounds of methyl bromide when the temperature of the material to be fumigated is not less than 60°F. Expose feed, spices, flour and other finely divided foodstuffs for eighteen hours—seeds, grain, coffee, etc. need only twelve hours. After the fumigation period, pull back the tarpaulin partially and allow 30 to 45 minutes for aeration. Then remove it completely. Don't drag your tarp on concrete or wooden floors where abrasion or sharp objects could injure it. Fold it carefully and place in a cool location for storage. If heat is excessive, dust tarpaulin with talc to prevent excessive tackiness.

WARNINGS AND SUGGESTIONS:

(1) Avoid doing tarpaulin jobs in closely confined space, but depend upon great dilution of the gas in a large space when tarpaulin is removed.

(2) Don't wear gloves when opening 1 lb. cans.

(3) Remove shoes or clothing immediately, if gas is spilled upon them.

(4) Do not permit workmen to move fumigated material until after 30 to 45 minutes of aeration.

(5) Obtain the new special strength tarps from Shane Manufacturing Company, W. Maryland at Buchanan Streets, Evansville, Indiana. Patching kits and "Snakes" are also available through Shane.

(6) Try to work out of doors—if possible on loading platforms. Concrete floor holds the gas but wooden ones should be caulked or covered with asphalt laminated building paper.

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Think of it! Mul-T-Vapor lasts five times longer than ordinary aerosol bombs.Comes with or without DDT—whichever is indicated. Easy to use—your youngest help can rid greenhouses etc. of insect pests in just a few minutes. Capacity approximately 1,250,000 cubic feet in one bomb.

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ALSO — Mushroom Houses, Commissaries, Institutions, Private Estates, Camps, Summer Resorts, Florists Shops, Ranches, Racetracks, etc.

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Pests

and Their CONTROL

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

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CONTENTS

"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

Editorial 7

Need for a Permanent City Rat Control Project 10
By F. E. Garlough

Methyl Bromide Fumigation of Plant Products in Railroad Freight Cars 14
By H. A. U. Monro and R. Delisle

Wartime Aviation Quarantine 24
By W. M. Herms

The Relation of Commercial Pest Control Operators to Community Sanitary Programs 28
By Elmer A. Kuntz

Notes on Dried Fruit Insects. 1 32
By Dr. Heber C. Donohoe

Iron-work in the New Orleans French Quarter 36

The Pest Control Operator and What I Would Expect of Him 42
By G. A. Bicherdorf

Write For These Booklets 46

Local Organization News 48

What's New in Pest Control—Personals 49

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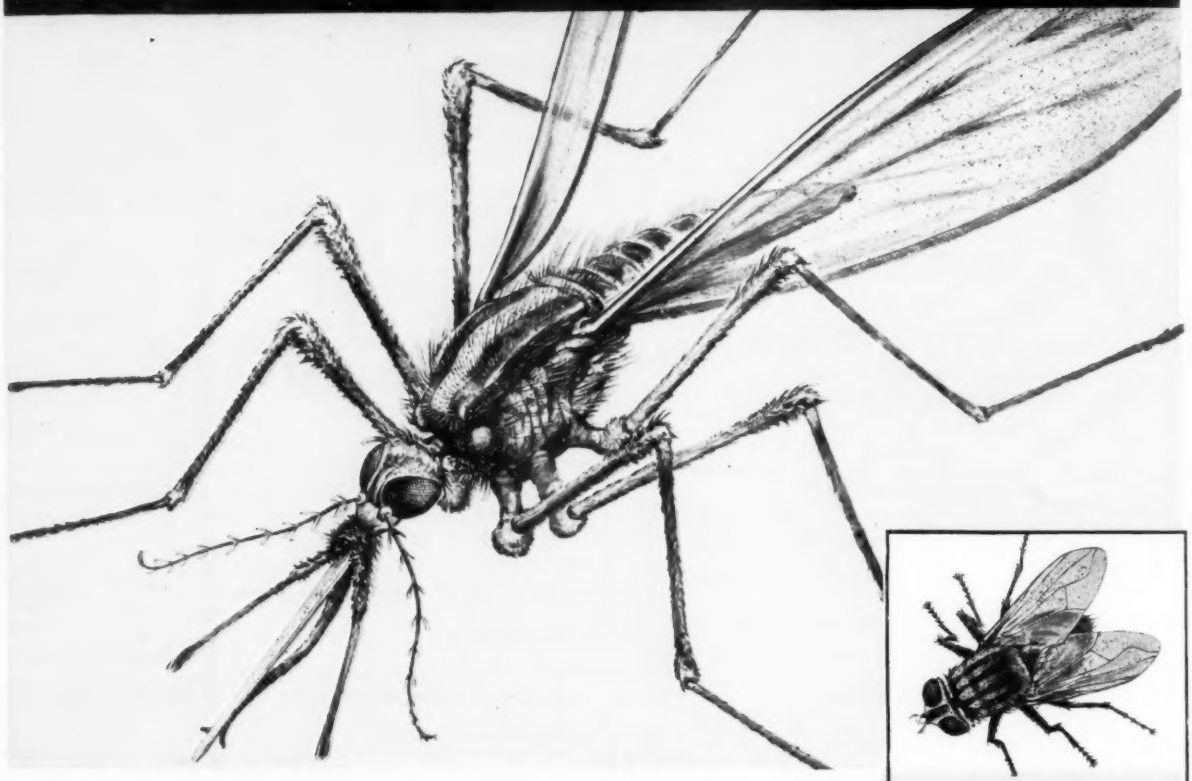
FOUR PESTS THAT CAUSE GREAT DAMAGE TO HEALTH AND CROPS



COMMON HOUSE FLY

CODLING MOTH

COLORADO POTATO BEETLE

Control by DDT

promises huge annual savings

DDT (Dichloro-diphenyl-trichloroethane) has shown phenomenal results in killing the mosquito and common housefly. The U. S. Department of Agriculture has provided suitable formulations of DDT for the control of these pests—which Baker will gladly supply upon request.

Experiments with DDT for the control of the codling moth and the Colorado potato beetle, costly horticultural pests, already show great promise. However, tests in the agricultural field, to be conclusive, generally require several growing seasons. As a result, only tentative formulation recommendations have been made pending further research.

Baker's DDT is a fine, crystalline powder approaching a white color, with a minimum setting point of 89°. It is available in 25, 50, 100 and 200 pound containers. Write for prices, stating your requirements.

FREE DDT BIBLIOGRAPHY—The J. T. Baker Chemical Co. has collated, in brief form, releases regarding DDT from various governmental branches. If you would like a free copy, write to: J. T. Baker Chemical Co., *Executive Offices:* Phillipsburg, N. J.

Baker's Chemicals

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EDITORIAL

The New Orleans Convention

NPCA's first post-war convention is to take place at the Roosevelt Hotel, New Orleans, October 28, 29 and 30. Always an oustanding event, this year it promises to be even more so. A record-breaking attendance seems assured and with good cause, a program attuned to the PCO's latest technical and business needs.

Fully explored on the agenda from both the platform and floor by men from government, university and commerce will be current research data, war-and-post-war developed rodenticides and insecticides, improved pest-control techniques, promising new-type business sources, stepped-up safety programs, threat of Government competition, etc. In short, a program no PCO whether a member of the HPCA or not, can afford to miss.

And a final reminder: with hotel space at a premium and travel accommodations still spotty, immediate reservations are urged.

Price the PCO's Hurdle

ONE of the primary reasons that so many business firms go rampant is that they desire to compete with their neighbor with regard to price. A PCO selling service to the public, to be sure that he is not outdone by his competitor, invariably considers the price angle in more ways than one. The PCO may be doing himself more harm than he realizes. During the war most firms were doing a healthy business. But during the post-war period when many others are entering the business of Pest Control there's bound to be some chiseling. When the price factor begins to loom up as a driving force to secure business one had better heed the old adage, "Look before you leap," Lena.

Statisticians and forecasters are reminding us that while volumes of business promise to hold up we are in a period of declining profits in many lines of business. The question of price is essentially important, especially in considering the cost of materials, chemicals, and operations today, as compared with their cost a few years ago.

Every PCO should consider being more interested in value and quality of service than in price. Perhaps it would be farfetched to ask why our NPCA has been so concerned for some months. Many complaints, either in fumigation service, termite control work or of haphazard ways of rendering service to a great extent have come because of conditions brought about due to price angle.

Could it not be then that the price factor is the cause of most of the PCO's ills? That old-age problem of selling PCO service as well as the importance of our profession to the public is something to be considered, especially when we are now in a new era of selling when a new conception of quality service is by far the most important factor of public interest.

The quality of products and material, quality of operations and service are what PCO's should consider above all things. Let every PCO become more constructive in his thinking, more serious, more conscious of quality of service and he will see that the best public relations will be service, not price consideration. Don't let price be your hurdle!

Orchids

ORCHIDS to The Chicago Tribune and to its feature writer, Clayton Kirkpatrick, for a splendid and timely series of articles exposing the deplorable rat conditions in the city's streets and alleys.

Mr. Kirkpatrick's recurring thesis with respect to the basic causes of the increase in the city's rat population, now estimated at 2½ million, is (1) refusal on the part of a small segment of the population to make an effort to clean up its rubbish and garbage, and (2) laxity of city officials in enforcing ordinances to that end.

Long realized by those who have made a first-hand study of rodent-riddance is the fact that baiting, gassing and trapping, essential as these are, can achieve their purpose only to the degrees that they are counterparted by a strong enforcement of the sanitary code and that anything less begs the question.

For there is no question that without legal intervention no rat problem, with its potential incidence of rat-borne diseases, rat bites, or its much greater likelihood of property impairment, can be brought under effective control.

More power to Mr. Kirkpatrick for his constructive expose—a type of critical analysis it is hoped he will continue to hammer home.

Customer List, Executive Advertising Theme

IN a bid to add to its list of customers, combat "price" competition, etc., the firm of Barnett's Pest Control of Dayton, Ohio, has been running a 600-line advertisement in one of the local papers on a 3-time-a-week basis.

Here are some of the copy highlights:

1. A list of the firm's customers (by industries), including their addresses and 'phone numbers, with readers invited to call any of them for information respecting the quality of service being rendered.

2. A succinct rejoinder to "price" competition phrased thus: "WE HAVE NO QUARREL WITH THOSE WHO UNDERBID US—THEY KNOW BETTER THAN WE WHAT THEIR SERVICE IS WORTH!"

3. The following paragraph which not only takes cognizance of a recent legislative trend but also gives the firm's regular customers a pat on the back (not a bad idea, incidentally):

> "Business firms of Dayton have not waited for an ordinance to be passed forcing them to protect their cus-

tomers from rodent and vermin infestations—most Dayton firms have, with this thought in mind, been using a constant Pest Control Service for many years."

4. These two self-explanatary paragraphs:

"THE OLD HORSE-AND-BUGGY DAYS OF PEST CONTROL PASSED WITH THE MIDWIFE.—We, too, used to park in the alley, come and go by the back door—after dark. Long ago, however, Barnett's Pest Control succeeded in building a better moustrap.

"WE HAVE NO CAUSE TO BE ASHAMED OF OUR NAME ON OUR CARS. Our cars, our men and our work are fully covered by insurance . . . "

In the main, a well thought out piece of copy, which, we think, will add respect to, increase sales for, its sponsor, a firm headed by R. K. Barnett.

DDT

DDT, hailed as the miracle insecticide, has been available for home use for almost a year. Here's what the average user thinks of DDT's value, according to a survey by "Science Illustrated":

Have you ever used an insecticide containing DDT?

MEN		WOMEN	
Yes	36.8%	Yes	40.1%
No	63.2	No	59.9

Were you satisfied with results?

MEN		WOMEN	
Yes	83.0%	Yes	87.0%

Why haven't you used DDT?

No use for it 51.0%

Other reasons: Too dangerous.
Not available.
Never heard of it.
Don't use every new thing that comes out.

The Changing Face of PCO's

ONE of the most sweeping changes that has taken place in the last few years, has occurred within the Pest Control Industry.

We have observed the same tendency so prevalent in other industries toward fashions in knowledge. We have seen it at work in various ways, both in regard to the haphazard means of gaining knowledge in the past and the present technique for developing knowledge so vital to the pest control service and the phenomenal interest shown and manifested on the part of PCOs to keep abreast of our ever-growing industry.

We have seen extravagant claims in one form of another based on too-hastily acquired "we know it all" knowledge. But the industry now has available a fund of dependable information, based on careful experiment and test. The present high status of our industry has been reached because of the foresight of our leaders, who realize the essential need and the paramount importance of having a thorough knowledge of chemicals and materials and the technique of better service. The constant research development of our time and the overwhelming desire to improve PCO service has brought about this marvelous change in our industry.

We cannot too strongly emphasize that to continue in business, one must acquire and make intelligent use of all the knowledge available, since the Pest Control Industry is and ever must be on the March of Progress.

Fourteenth Annual Convention

AS EACH succeeding Annual Convention of the National Pest Control Association seems to be better than the one before, it appears that the 14th Annual Convention to be held at Hotel Roosevelt, New Orleans, La., October 28 to 30, should command the earnest consideration of pest control operators throughout the country. To fail to attend may mean an actual monetary loss to forward-looking PCO's.

At New Orleans there will be a splendid staff of leading men who will address and give invaluable information in the essentials of pest control work. Since in these days science is exciting news, there may never be a more important year than the year ahead in the pest control industry. Never in the entire history of the industry have PCO's faced such momentous issues. The operator who fails to keep up with new methods and products, new ways of doing things, may find himself outdated and passed by, with the business which should logically be his going to a more up-to-date competitor.

Remember, the attendance at this Convention is expected to be at an all-time high, and the program to be the best ever. Pests speaks for the pest control industry, and endeavors to reflect all that has to do with it. The splendid work being done by the NPCA merits our thanks. The vision of those who are carrying on such outstanding activities deserves our praise.

A more fully detailed and outlined program will appear in the October issue of Pests. However, the doors of the Fourteenth Annual Convention are open to every pest control operator, regardless of whether he is a member of the NPCA or not. The invitation is for all who care to attend. Don't miss the October issue. See the program and Convention story.

Please Note

The editorial notice "Theatre Pest Control and the PCO" which appeared on page 7 in the July issue was referring to the article "Management Can Beat Its Insect Problems" by Dr. H. Shepard.

Because of unforeseen circumstances developing at the last moment, the article did not appear in the same issue. In the August issue, page 7, we published a notice that the article would appear in one of the future issues. We regret that this was not quite clear.

Flowability is a mighty important characteristic to both the makers and users of pesticide dusts. It simplifies concentrate compounding . . . adds great value to dilute mixtures . . . paves the way to trouble-free, equipment-saving final applications. To insure free-flowing qualities is one duty of the carrier or diluent, and Attaclay performs this vital job in stride. In the trade, *Attaclay* and *flowability* have become synonymous.

This year, one out of every three pounds of DDT going into dust concentrates is impregnated with Attaclay. Why? Because processors—among the country's largest—find that Attaclay practically eliminates grinding problems peculiar to DDT dusts . . . that 50% Attaclay-DDT mixtures turn out lump-free.

If you work with liquid toxicants, you'll be interested in the fact that Attaclay will adsorb as much as 30%, by weight, of oil containing various poisons, yet flow freely. And, since many new organic poisons tend to be oily, waxy or viscous, such amazing adsorptivity is a factor you need, as never before.

Attaclay has more features you'll like. Its uniformity permits dependable formulation. Its high degree of chemical compatibility has been amply demonstrated. Its low bulk density spells economy over heavier carriers. And it's immediately available in whatever quantities you need.

We'll welcome an opportunity to go into the use of Attaclay in your products . . . to send a generous sample for your test. No obligation, of course. Please write:

ATTAPULGUS CLAY COMPANY

DEPT. R, 260 SOUTH BROAD STREET, PHILADELPHIA 1, PA.

Need for a Permanent City Rat Control Project*

By **F. E. GARLOUGH**, *Senior Biologist*
U. S. Fish and Wildlife Service

*Paper presented before the First Short Course on Pest Control for Sanitary Inspectors held at Purdue University, Lafayette, Indiana, April 29-May 3, 1946.

THERE are two main reasons for a permanent city rodent control organization to furnish the necessary leadership in the control of rats.

1. Challenge of the natural habits of the rodents.
2. Requisites for efficiency in operations.

Perhaps the need for permanency of organization for the control of the common house rats as regards the first reason can be no more clearly presented than by giving a brief account of the evolutionary development of operations in the control of ground squirrels and prairie dogs in the Western States. In this unfolding of field practices, there have been 5 steps made since 1915.

Progressive Steps in Operation

1. Individual farmers trying to suppress rodent populations by treating their own property after reading a bulletin on the subject.

This method of procedure was in operation in field rodent control from the time of the early Mission Fathers in California, about 1800, until 1915. The ground squirrels continued to increase and spread over new areas as the domestic crops became more abundant and widespread. During this period an occasional community drive against the squirrels was reported and gave better results, but the individual effort system was the usual practice and was failing to reduce the rodent population. Why was this method of procedure not a success? Several reasons may be given:

1. Many farmers failed to understand or apply properly the recommended method.

Without suitable equipment and the best bait materials, poisoned grain baits were often not prepared so that they would be readily accepted by the rodents, and generally the bait was not exposed at the right time to obtain best results.

Ground squirrels feed part of the year mainly on green feeds, particularly in early spring, and part of the year chiefly on mature grain and weed seeds, particularly in summer and early fall. Use of bait materials must be employed accordingly. The learning ability of rodents also necessitates changes of bait materials and of poisons, and they must then be used in rotation as rodents begin showing these discriminations. It often required a little preliminary test work to determine when these changes were occuring and not many individual farmers would take this time from other work to do it.

These same facts apply to rats and residents in rat control in cities.

2 Too small a number of farmers did any work, and these were scattered over a wide territory.

This kind of operation left too many untreated farms and public lands that were also heavily infested with rodents and these soon reinvaded the treated farms.

This same fact applies to premises and to residents in cities in rat control.

3. Certain natural habits of the rodents defeated loose, unorganized efforts of control.

Let us consider a few of these habits:

a) Variable feeding habits of rodents.

Rodents vary in their daily choice of foods much as man does. This variable feeding was generally not recognized and the selected bait materials were not accepted by the rodents at the time exposed. The usual farmer did not have time to consider these facts nor to determine what and when to use certain methods of control.

These same facts apply in general in rat control.

b) Shifting movements of rodents in their habitats.

A portion of a rodent population remains quite close to their original living quarters, but a good portion of it, especially at the time when the young of the season are starting out on their own, moves into new territory. This fact was checked on the Columbian ground squirrels in 1927 in Washington State on an alfalfa field. From April 10 to May 10 every ground squirrel was removed from a 10-acre alfalfa field by means of poisoning, trapping, and gassing. It was then checked every day until May 25 when 2 squirrels were seen. At once 300 traps were set at burrow entrances in the alfalfa field near the fence adjacent to a wheat fallow field on one side of the alfalfa, and a grazing pasture on another side, in which there were many squirrels. By June 10, 700 young and old squirrels had been caught while making their way into the alfalfa field. Not all were caught, for the alfalfa field was soon well reinfested. This shows why scattered individual efforts at control by farmers fail to reduce a rodent breeding population.

A migration study was conducted in the Hawaiian Islands by H. J. Spencer on the natural drifting habits of the Norway, Alexandrine, and black species of rats in a brushy area in which they were living. Several of each species of rats were caught in live traps, tagged, and released after live trapping stations had been systematically established over an area comprising 47 acres. After a month's time, several of each species had been recaught several times. The Norway rats had drifted from their original station, where they had been caught and tagged, a distance of ¼ mile, the Alexandrine 1/7 mile, and the black ¼ mile. This means these species of rats may drift over a city area from 3 blocks square to 9 blocks square where blocks are about 420 feet on a side.

Dr. R. H. Creel, Surgeon, U. S. Health Service, ran an experiment in New Orleans in 1915 to study the migratory movements of rats in a city. One hundred and seventy-nine rats (93 full grown and 86 half grown) were caught, marked, and released in a residential section of the city on March 28. They were all released the same night within the same block. During the following day 19 were found dead within a short distance of the point of release and showed that they had been injured in handling.

Forty of the 160 remaining rats made widespread excursions. Of the 179 released, 103 were retaken. Table I gives a summary of the results.

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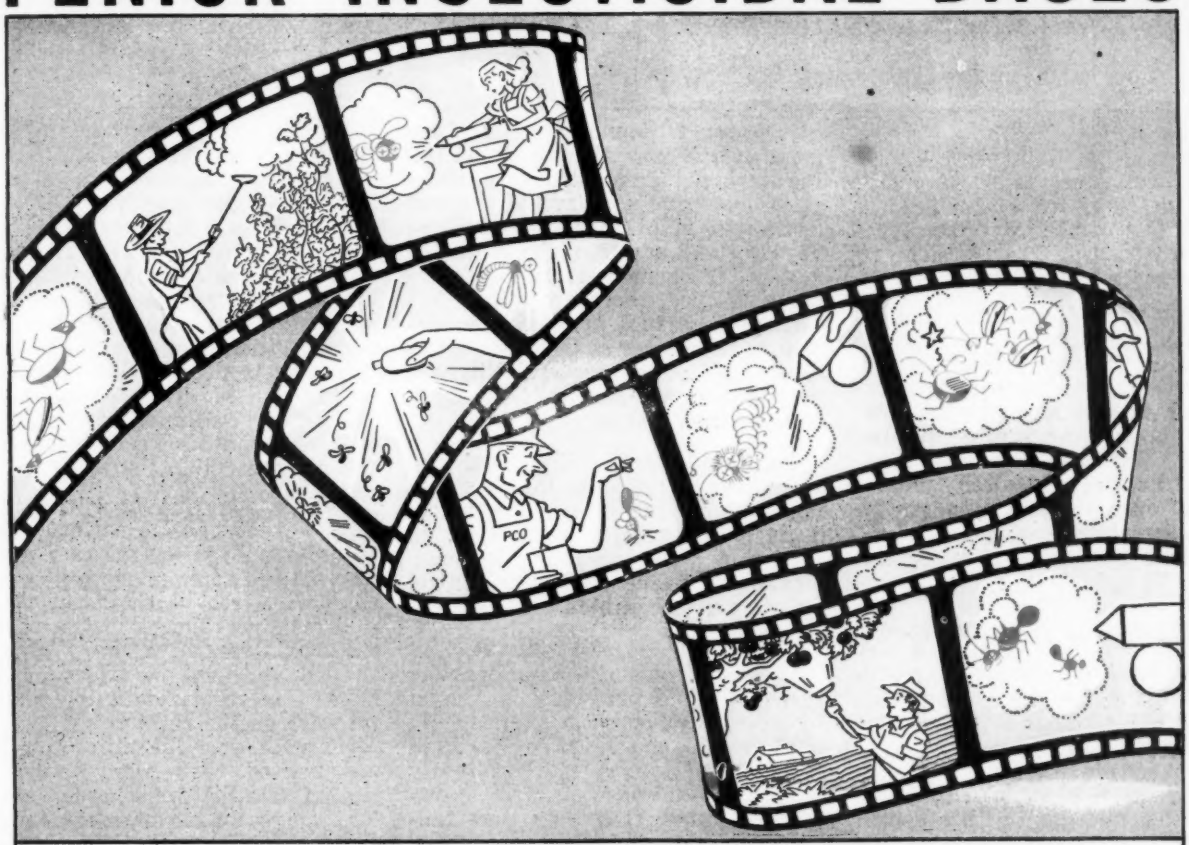

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TABLE I.

Area Rats Released	Rats Re-trapped		Rats Re-trapped Within							
			3 Blocks		½ to 1¾ miles		2 to 3 miles		3¼ to 4 miles	
	Caught No.	Time Days	No.	%	No.	%	No.	%	No.	%
Residential	103	37	59	57	21	21	13	12	10	10
Business	60	26	52	87	6	13				

Another series of 113 rats were released during the night from a place in the wholesale provisions warehouse district of New Orleans on April 8. Sixty of this number were retrapped within a period of 26 days. The results are given in Table I.

The table definitely shows that the accessibility of food and shelter has much to do with the migratory drift of rats; therefore, the drifting activities of rats have a very vital influence on the application of methods of control. Operations must be organized and applied intensively and extensively over a relatively short period of time to stop a spread of rat populations.

c) Active and inactive periods.

All individual ground squirrels do not feed every day because of laziness, indisposition, not hungry, or they drifted out of the treated areas that day. If methods of control are applied on that particular day, some squirrels remain alive on the area treated through no fault of the operator, or his methods on that particular day. This fact is true respecting rats.

Individual rats do not feed at the same place every night or every time that they feed. Try setting an open full garbage pail in a backyard where rats have not been seen for months and then watch for them to appear about the can in a few nights.

To meet this situation requires organized effort that will take this condition into consideration and will apply methods accordingly.

d) The aggressive nature of rodents.

These animals have a strong will to live and take advantage of any opportunity to obtain food and maintain their race.

Our control efforts have to be organized to meet this strong characteristic. We have just had an example of this in human affairs. We were not able to overcome aggressor nations until we organized and unified our defensive efforts.

e) Breeding Potentiality of rodents.

Unless the results of control operations and natural mortality reduce the population of rodents in a season, or breeding period of a litter (as in rats) over 80%, no gain has been made in the reduction of the breeding stock of the rodent. Some species of ground squirrels have an average of 8 young in a litter per year. These 8, plus the 2 adults, make 10 in the family. If no more than 8 of them are destroyed, there are still 2 left for breeding stock next breeding period, same number as the original two adults. Rats have several litters a year, which only increases the difficulty of the problem.

Individual farmers killing squirrels, or individual residents in cities killings rats, did very little toward reducing the breeding population. In fact, they were increasing in many locations. To be effective, control efforts must be unified to reduce the breeding stock over extensive areas.

These are some of the reasons why this method of procedure in ground squirrel control operations failed from 1800 to 1916, and in rat control from the dawn of history until the early 1920's. When rodent control operators recognized that they were failing to reduce the rodent populations in the field for only short periods of a year, they sought improvements both in methods and in their application. This led to the second step.

2. Introduction of educational programs for the farmers, and demonstrations to them in the manner of preparing the bait and in exposing it in the field. The actual control operations were left to the farmers.

Under this procedure, more farmers became interested, but after holding meetings and demonstrations in the Farm Bureau Centers in most of the counties of a State, there still were too few of them who did work, and too scattered, so that the final results were not much better than those under Step No. 1, and for about the same reasons. We then went a step farther toward leading and directing the actual control operations. This same type of work has been done in rat control operations with about the same results.

3. The introduction of community drives with a limited amount of educational information and demonstrations.

Under this type of procedure, a portion of a county heavily infested with squirrels was selected as a unit, and on a certain day the farmers collected at some central point and helped prepare the poisoned grain; then they were arranged into crews of 5 to 10 men, one of whom acted as foreman. Each crew was assigned certain territory to treat, and then all the farms belonging to men present were thoroughly treated. This continued each day until the selected area was covered, or as much of it as belonged to the men present.

This was a vast improvement in results over any other method of procedure employed so far. In a section where 1,000 acres or more in a solid block were treated, the population of squirrels was almost destroyed and the next season a few squirrels showed up here and there in this block. The results definitely showed we were on the right track.

However, over the entire area that was treated, there were always too many farms that were not treated, or for some reason too many squirrels escaped on a farm that was treated, and these served to reinfest the area in about the third season following.

This proceduce for both field rodents and rats did not prove to be entirely satisfactory because of the untreated places left, the irregular results on some places, and the impossibility of maintaining the farmers' interest to keep treating his place following the initial treatment. He appeared to have less and less time to do the work, and this led to the next step.

4. Introduction of the trained rodent crews working under competent Rodent Control Supervisors.

In this operational method, the crews treated each farm as they came to it and had obtained consent to treat it. They had the law back of them to go any place where the owner refused. The farmer paid for the materials and labor expended on his farm. He often found it cheaper than he could have performed the work, and obtained like results.

This procedure caused a great reduction in the squirrel population and reduced the losses to a small fraction of what they had been because exten-

sive areas were thoroughly and systematically covered within a season or breeding period of the rodent. The system met and overcame the rodent's lines of defense, previously discussed. Aggression was met with an organized defense.

What this method of procedure amounted to operationally was really the farmers hiring these crews of specially trained men to do the specialized job of rodent control. In the rat control program, these crews may be the personnel of pest control companies in cooperation with the city rat control organization, or special city crews.

This step failed in one respect. It did not cover the abandoned infested farm generally belonging to an absentee landowner, did not catch the small population of squirrels left from the major operations, nor prevent rodent colonies from reinvading clean areas. To meet this situation, the next step was made.

5. The introduction of the permanent Rodent Control Crew operating under a Rodent Control Supervisor at county expense to treat those places not otherwise covered.

This crew well justified itself in field rodent control for it prevented population build-ups, kept down economic losses, and reduced the hazard of the spread of rodent borne diseases.

There are comparable locations in cities infested with rats which may be handled in the same manner in connection with other methods of procedures employed in order to maintain a low rat population in a city.

Requisites for Efficiency in Operations in a Rodent Program

May we mention some requisites that appear to be required and can be gained only through an organized rat control program:

1. A supervisor trained in rat control to coordinate all rat control activities.
2. Trained personnel to perform the control work.
3. Systematic coverage of a large infested area not less than a city block, within the shortest possible time.
4. A regular inspection of potential rat infested areas.
5. Cooperation of different departments of a City Government affected by rat problems.
6. Coordination of all control efforts under one division of a department which is made responsibile for the reduction of rat populations and for the maintenance of the lowest possible number of these rodents.
7. It gives a definite organization with which Government agencies can cooperate in passing along improved methods of control learned through their research laboratories and operational forces.

This need does not mean that the city is to embark on a program in which the city is going to do all the work for the citizens of the city. It means, rather, that the proposed city rat control project is to furnish the unified leadership in education and publicity regarding the rat and the application of the various methods of rat control. The city has plenty of areas of its own to keep rat free, which, through its city rat control organization, it can do along with the citizens who are property owners and occupiers of property. The methods and their application are governed somewhat by local conditions, though the underlying principles are such as have been described.

City Revokes Exterminators' Licenses

The Orlando (Fla.) city council revoked the license of the National Chemical Exterminator Co., and "all other licenses connected with C. J. Melton and Ray Chiles." Action was taken following receipt by council of a letter from a Mrs. H. A. Pennock, of Jupiter, in which she stated that the National Chemical Exterminator Co., of Orlando, had offered to spray her house for termites at a fee of $100, then had informed her that more work and materials would be needed than at first estimated.

Upon completion of the job, Mrs. Pennock stated, she received a bill for $616.

The operators of the company appeared before the council this morning and admitted the truth of Mrs. Pennock's statement, and further said that "about six hours work" was done on her residence and garage.

Com. George Sipple questioned Melton and Chiles at length, and voiced the opinon that "it is high time rackets of this sort are brought to an end."

Upon the unanimous vote that the National Exterminator license be revoked, Melton told council that "he has a license in his own name and that council could take it also." Council obliged by amending the revocation motion to include "any and all licenses held by Chiles or Melton. The National Chemical license was held in the name of Chiles. (May, 1946)

Facts outlined in news item reprinted above emphasize anew that it is high time that John Q. Public be advised to investigate before having work done. Failure to do so is inexcusable and invites racketeering. In this instance, however, the property owner is to be complimented for at least taking action and sticking with officials who were willing to prosecute if the property owner would supply facts, testify, etc. Much too often the property owner merely complains but is not willing to follow through.—Ed.

"They Learn About Rats"

Representatives of several Virginia cities joined men from the Richmond City Health Department on June 17 in attending a five-day school on rodent control, sponsored by the Health Department. At right, J. Clifford Mitchell, chief of the Bureau of Sanitation, holds a piece of rat-proofing material, while R. L. Norton, of the National Pest Control Association, at Mr. Mitchell's right, demonstrates how it is assembled. Others in the picture, members of the class, are unidentified. Photo. Courtesy Richmond Newspapers, Incorporated.

Methyl Bromide Fumigation of Plant Products in Railroad Freight Cars[1]

By **H. A. U. MONRO**[2] *and* **R. DELISLE**[3]
Dominion Department of Agriculture, Montreal, P.Q.

AS A RESULT of the finding of severe insect infestation in cargoes of plant products imported into Canada in the early part of the war, the Division of Plant Protection, Dominion Department of Agriculture, was obliged in 1942 to institute a policy of inspecting such cargoes immediately on arrival in this country and insisting on treatment when considered necessary. The object of this work is not merely to disinfest the imported goods themselves, but also to prevent the spread of the large insect populations involved to other commodities, during handling in steamship sheds, railroad cars, lake and canal steamers, trucks and terminal warehouses.

During the seasons of 1944 and 1945 large bulk consignments of plant products arrived in this country in steamships. Moreover, the activities of this Division in inspecting shipments and stipulating treatments had the effect of bringing the value of this type of control to the attention of representatives of food distributing organizations and transportation companies. As a result, our inspectors were asked to supervise the treatment of export shipments of foodstuffs, notably consignments sent by the International Red Cross to distressed European countries.

All the treatments were carried out by qualified pest control operators or concerns expert in industrial fumigation, working under the supervision of our inspectors.

The majority of the treatments were made in railroad cars, and the fumigant used was exclusively methyl bromide. It is thought that the experience gained in the course of this work might be of general interest, although most of the treatments were made with Canadian railroad equipment.

With the exception of three cargoes which arrived at New York, all the import shipments were unloaded at Canadian ports. For the most part the cars employed were of 3,710 cubic feet capacity and were usually loaded with 400 to 500 bags of commodities such as peanuts or chick peas, a total commodity weight of approximately 70,000 to 90,000 pounds.

The loaded railroad cars were diverted, as far as possible, to isolated yards remote from human habitation where four or more tracks were available for holding the cars during treatment and aeration. It was found desirable to segregate the cars undergoing aeration on a special "ventilation" track, so that the fumigating crews preparing the next batch of cars for treatment would not be exposed to the gases diffusing from those being aired out.

Commodities Treated and Insects Infesting Them

During the calendar year 1944 a total of 878 railroad car fumigations were conducted under our supervision from Halifax, Nova Scotia to Vancouver, British Columbia, involving a total of approximately 30,100 short tons of goods. The more important commodities, with the names of the insects infesting them, are described herewith.

Peanuts: Large consignments of British Indian, Nigerian, and Argentine shelled peanuts arrived in steamers during 1944 and 1945. These were all found to be severely infested at the time of unloading with the following species of insects:

Coleoptera	**Tribolium castaneum** Hbst., Red flour beetle
	Dermestes ater De G.=**cadaverinus** Fab.
	Tenebroides mauritanicus Linn., the Cadelle
	Necrobia rufipes De G., Red legged ham beetle
	Oryzaephilus surinamensis L., saw-toothed grain beetle
	Carpophilus sp.
	Latheticus oryzae Waterh. Longheaded flour beetle
	Ahasverus advena Waltl. Foreign grain beetle
	Loemophloeus sp.
	Rhizopertha dominica Fab. Lesser grain borer

1. *Contribution No. 55 from the Plant Protection Division, Science Service, Department of Agriculture, Ottawa, Ont. This article is a condensation, with modifications, of a paper published by the above authors in Scientific Agriculture*, 25:12, 794-816, *August*, 1945.
2. *Supervising Inspector in Charge of Fumigation, Division of Plant Protection, Montreal, P.Q.*
3. *Inspector, Division of Plant Protection, Montreal, P.Q.*

Lepidoptera	**Ephestia sericarium** Scott=**kuehniella** Zell., Mediterranean flour moth
	Corcyra cephalonica Staint. The rice moth
	Plodia interpunctella Hbn., Indian meal moth (in shipment of Indian peanuts at Vancouver only)

Cotton Seed Meal: A shipment of approximately 1,000 tons of cotton seed meal in bags was made from Brazil to Canada in the late spring of 1944. This shipment came direct by rail via a United States port and was transported to a number of consignees throughout Eastern Canada. Several consignees refused to accept this material into their warehouses on finding a large number of insects, subsequently identified chiefly as larvae of the cigarette beetle **Lasioderma serricorne** F., with a few adults of **Tribolium castaneum** Hbn. present also. A number of railroad car fumigations were successfully carried out.

Cocoa Beans: During the season of 1944 five carloads of imported Jamaica cocoa beans were treated. The following species of insects were found on these beans, and were subsequently successfully controlled by the fumigation.

Lepidoptera	**Ephestia cautella** Walk. Almond moth
Coleoptera	**Tribolium castaneum,** Hbst. Red flour beetle.
	Catorama sp.
	Typhaea stercorea L. The "Hairy fungus beetle" or "Haybug"
	Ahasverus advena Waltl. Foreign grain beetle
	Carpophilus sp.
Hemiptera	**Xylocoris** sp. These insects bit the men handling the bags of beans.
Dermaptera	**Prolabia arachidis** Yersin, Earwig

Exports

Chick Peas: In late April 1944 at Saint John, N. B., portions of a large shipment of chick peas ("Garbanzos," the seeds of **Cicer arietinum**), en route to Greece through the agency of the International Red Cross, were found by our inspectors to be infested by the cow pea weevil **Callosobruchus maculatus** Fab. (**Mylabris quadrimaculatus** Fab.). These peas had been grown in Mexico and were a gift of the United States Government to the people of Greece. In treating this shipment a considerable amount of reloading had to be carried on in order to transfer the bags to Canadian steel box cars from the original cars, which belonged to United States railroads and were largely of wood construction or were otherwise unsuitable for fumigation.

Wheat: In September 1944 a shipment of wheat grown in the United States and en route to the British authorities in France via Saint John, N. B., was refused for loading on board the steamer by the steamship agents, following the finding of an outbreak of **Plodia interpunctella** in parts of the consignment, which was packed in 100-pound bags. Our inspectors were again asked to supervise the fumigation work. In this case, also, a considerable amount of reloading of cars had to be undertaken.

Chicory Root: A shipment of 1,046 bags of chicory root on the way from Montreal to Iceland in November, 1944, was found, at the time of loading at Halifax, to be infested with **Plodia interpunctella** Hbn. This material was fumigated in two steel box cars, the interesting aspect of this work being the low temperature at which the treatment was carried out and which will be fully described under "Results."

Steel Box Car Construction as Effecting Fumigation Work

In Canada we have the advantage of dealing, for the most part, with only two railway companies with fairly standardized equipment. This article deals mainly with Canadian rolling stock, but it is believed that many of the observations on car construction can be applied to American equipment although it would be, of course, impossible to draw up any list of car series owing to the large number of different railway companies in the United States.

The use of methyl bromide in Canada for fumigating goods in steel box cars was first discussed by Monro and Delisle (3). As was to be expected, it was subsequently found that the success of the

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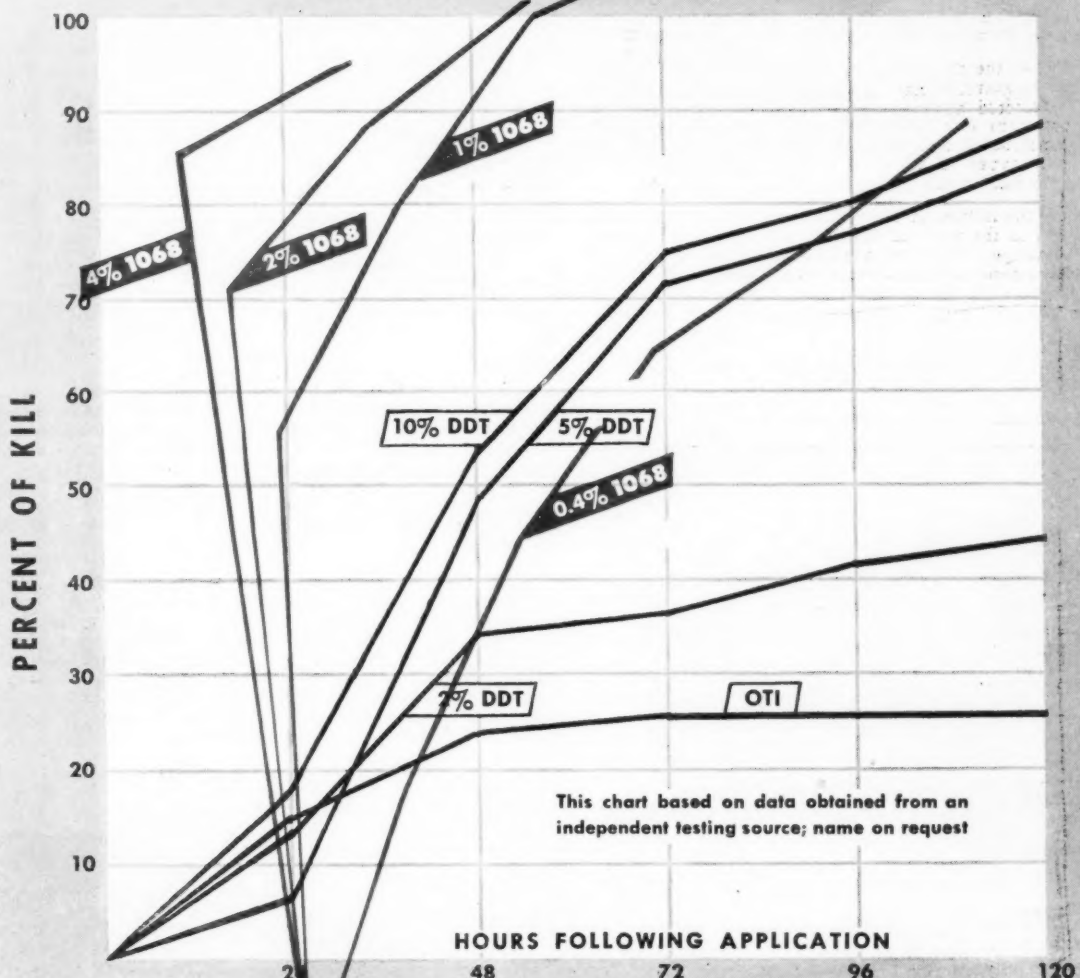

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treatments depended greatly on the construction of the individual cars, especially in the structure and method of attachment of the roofs. As a result of observations made on the construction of steel box cars during a large number of fumigations, and following consultation with the officials of the mechanical departments of the two principal Canadian railway companies, it has been possible to prepare lists by number series of preferred classes of steel box cars most suitable for fumigation work, in view of their being sufficiently air tight not to require sealing other than at the doors. As a matter of general policy wooden box cars are not permitted to be used, although in exceptional cases, these have been successfully employed. (During the severe steel shortage a few plywood box cars of design similar to recent steel box cars were constructed by the Canadian Pacific Railway Company. These proved to be in every way as good as steel box cars for fumigation purposes.) Steel automobile cars have never proved satisfactory, and are not accepted for this work.

In "steel box cars the walls and roofs are made of steel, but the floors are constructed with boards, usually British Columbia fir, 4 inches wide and 2½ inches thick, joined by tongue and groove. Leaks of fumigants do not usually occur through the floors.

As a general rule, the air-tightness of a steel box car deteriorates with age, as constant vibration enlarges seams and cracks in the walls and roofs. It is therefore desirable to rule out, as far as possible, steel box cars more than 15 to 20 years old. Canadian steel box cars constructed approximately between 1927 and 1940 were equipped with types of all steel roofs known principally as "dry lading" or "radial" roofs.

These roofs, by the nature of their construction and the method of their attachment to the walls of the cars, will permit a considerable amount of leakage. The three types of roof construction encountered in these classes are illustrated diagrammatically in Figures 1 and 2. The Canadian [illegible] Railways "radial" roof has transverse carline caps and a longitudinal ridge cap at the point of junction of the steel roof plates. At each end of the car, also, the end plate is bolted over a wood sill of "fascia." At both these points continual leakage of methyl bromide has been observed. The "dry lading" steel roof of the Canadian Pacific Railway cars has transverse carline caps at the junctions of the steel plates, but these latter extend the full width of the car, and there is therefore no longitudinal ridge cap. This latter advantage is offset, however, by the fact that the roof rests on wooden fasciae at both sides and ends.

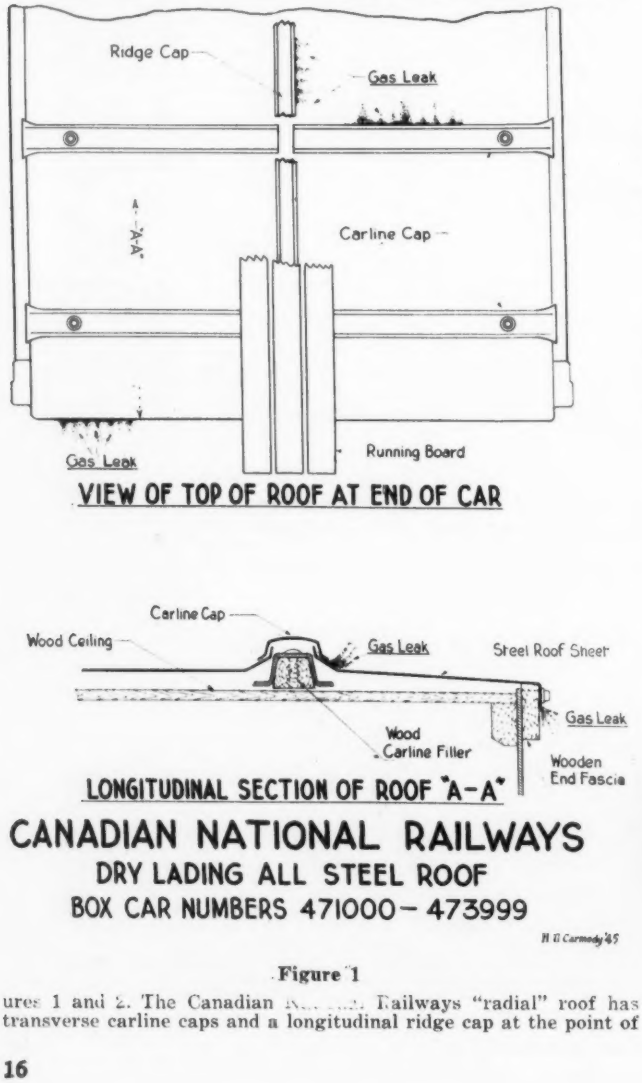

Figure 1

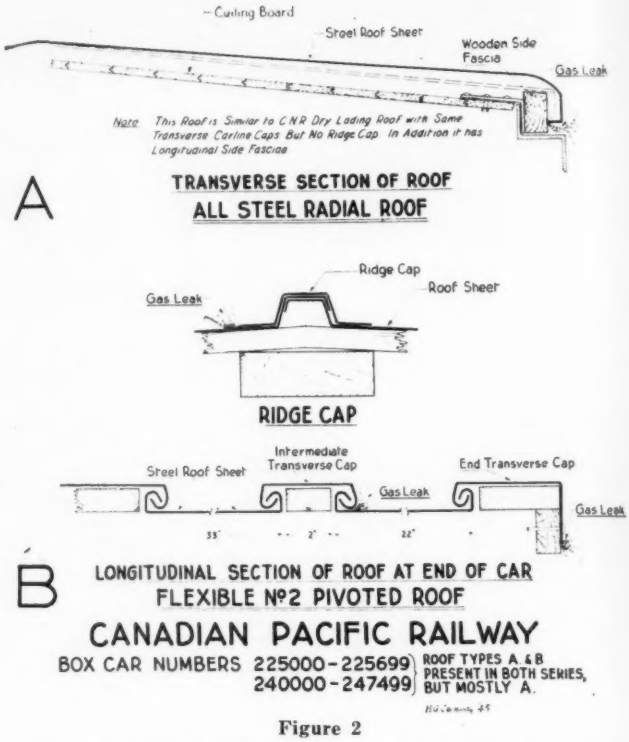

Figure 2

These roofs are also illustrated in photographs of the box cars in Figures 3 and 4. With continued wear and tear, warping and displacement of the steel plates and the wooden fasciae occur to aggravate the amount of gas leakage. Pest control operators state that an additional four or five man-hours of work in sealing these cracks are required to render the cars fit for a satisfactory fumigation. As far as possible, the co-operation of the railway officials is solicited to avoid the use of these types of cars for conveying infested commodities requiring treatment.

Figure 3. Older type Canadian National Railways steel freight car with wooden "fascia" at end of roof.

The Canadian Pacific Railway "pivoted" roof (B in Figue 2) has never been encountered on all steel cars, although officials state that it is employed. It is common on wood box cars with steel roofs. The great possibility of leaks through the intermediate transverse caps, which could not be easily sealed off, would seem to rule out from the beginning box cars so equipped.

In recent steel freight car construction, mostly during the last four or five years, both Canadian railway companies have employed all steel roofs, described either as the "riveted roof" or "solid steel roof." An example of this roof is illustrated in Figures 5 and 6. The steel plates are riveted or welded together and the seams filled with a caulking compound. The entire roof is then riveted and

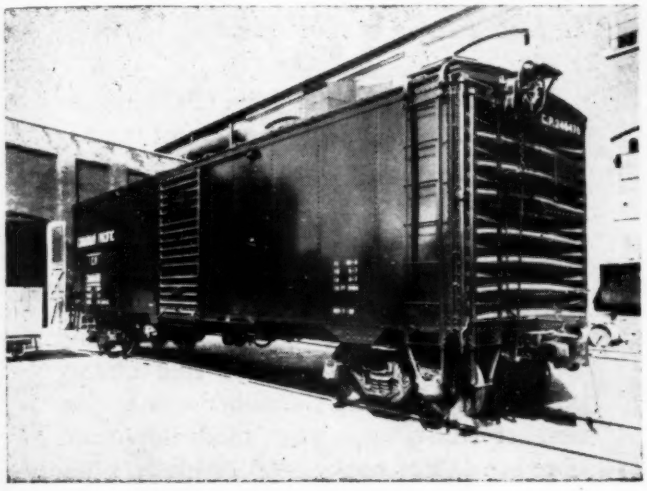

Figure 4. Older type Canadian Pacific Railway steel freight car with wooden "fasciae" at end and sides.

caulked onto the walls, so that an airtight structure is produced. These cars are so well made that they form perfect fumigation structures and, if thoroughly sealed, the amount of gas leakage from them appears to be practically nil, so that a constant minimum dosage can be safely employed.

In our experience steel freight cars owned by railways in the United States which have been used while in Canada have not, on the average, been so suitable for this type of work. This has been due, for the most part, to the fact that American cars seen in this country have been both considerably older, dating many of them prior to 1929, and subjected to more wear and tear. A number of recently built cars, similar to the Canadian all steel car with the riveted roof, have been encountered, proving to be as suitable as the most recent Canadian types.

Observations made during the season of 1945 on box cars of United States origin have indicated that even recently built steel box cars of certain types allow significant leaks of the fumigant. A car constructed in 1945 was found with a riveted steel roof similar to the one shown in Figure 5. However, there was no wooden ceiling as illustrated in Figures 1 and 2A, and apparently sufficient caulking had not been applied to the junctions of the steel plates. During fumigation methyl bromide leaked through this. It is interesting thus to learn that a well constructed, closely joined wood ceiling plays an important role in aiding gas retention.

Testing for Leaks

Most of the observations on gas leakage were made during the fumigations with the aid of the commonly employed "Halide Leak Detector," various types of which are manufactured and marketed by different companies.

During 1945, through the kind co-operation of Major R. B. Harvey and Captain G. C. Wilson of the Chemical Warfare Laboratories, Department of National Defense, Ottawa, and also Dr. R. G. Law, Chief Sanitary Inspector, Canadian National Railways, tests were made in a number of empty freight cars of different types with smoke generators of the type used during the recent war. These generators contain a mixture of hexachloroethane and zinc oxide, and when ignited emit a dense white smoke, which is relatively harmless to human beings if not breathed too extensively. The type most suitable for testing railroad cars was a smoke shell component converted as a generator. Such units emit ample smoke

Figure 5. New type riveted steel roof as used on Canadian National Railways steel freight car (see Figure 6).

for all cars and have a burning time of approximately 2½ minutes. When first ignited the generator gives off sparks, and considerable heat is generated during evolution, so it is necessary to place the unit in a metal pail or drum, preferably with a layer of sand placed at the bottom.

These smoke units are very useful for studying the source of leaks in railroad equipment and other structures. So far no tests have been made in loaded cars or warehouses.

Figure 6. New type steel freight car with all steel roof.

Fumigation Methods

Fumigant Employed

In all this work methyl bromide was the fumigant employed, either alone or in combination as a proprietary fumigant containing approximately 93% carbon dioxide and 7% methyl bromide.

Methyl bromide (H_3Br) at ordinary temperatures is an odourless gas, boiling from a colourless liquid at 40.1°F and having a specific gravity (Air—1.00) of 3.27 at 32°F. It is thus considerably heavier than air. The molecular weight is 94.94. Experience has shown that it tends to stratify if introduced at the lower part of a fumigation structure, but once thoroughly mixed with air by fan circulation or diffusion it remains in equilibrium with all parts of the atmosphere of the structure. It is lost very rapidly through any point of leakage.

Methyl bromide alone is supplied in 1-pound cans or cylinders of different weights. When mixed with carbon dioxide it is usually

Pest Control Knows No Off Season!

If you manufacture pest control chemicals or equipment, you will want to be represented in the important October issue of PESTS and THEIR CONTROL, the annual convention number which is distributed at the National Pest Control Association convention, to be held at New Orleans, October 28-30.

Because of its indispensable place in matters of public health, comfort and property preservation, there is no single season in the year when the pest control profession can relax—its job is to be alert 24 hours a day, every day of the year.

However, there is one time each year when Pest Control Operators are more likely to be considering new control chemicals, equipment, techniques of operation, namely at the time of the N.P.C.A. convention.

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marketed in cylinders containing 50 lb. of the mixture.

The natural vapour pressure in methyl bromide containers is: at 50°F—4 lb. per square inch; 60°F—8.5 lb.; 70°F—13 lb.; 80°F—19 lb.; 90°F—25 lb.; 100°F—32 lb.

Sealing the Cars

In box car fumigation considerable care and thought must be given to the extra sealing required, to prevent avoidable leakage of the gas. Methyl bromide is very volatile and quickly diffuses through any leaks in the structure. As already pointed out, in the best type of steel box cars sealing in the region of the doors is all that is required.

Experience has shown that the best method is to seal both doors from the outside, so that every point of leak detected round the sealing is accessible after sealing is completed. Many insects attempt to escape from the gas by crawling into cracks in the floor and under the door, and outside sealing ensures both that the fumigant is able to penetrate these cracks and also that the insects are unable to reach the outside air. In addition to sealing around the doors it is also necessary to seal off small leaks around the rollers of the door tracks. Other points of leak may be encountered from time to time, such as rain drainage outlets found in some types of cars.

Under normal conditions effective sealing can be done with brown paper liberally smeared on both sides with a good quality casein paste or one containing a mixture of flour and oil. A sticky mineral jelly such as vaseline (petrolatum) has been used to stick down the paper, and this is especially useful at lower temperatures, but it is necessary to wipe the surface afterwards to remove the jelly to prevent accidents liable to be caused by the slippery surface. Other methods have been successfully employed at the discretion of the individual operators, including the use of a mixture of calcium chloride and asbestos.

At one time masking tape was employed extensively, but during the recent war was difficult to obtain. Under all conditions it is not as consistently satisfactory as the other materials described above.

Applying the Fumigant

As the whole treatment was placed in the hands of the commercial operators, the methods of applying the fumigant were left largely to their individual choice. Actually, for the reasons discussed hereafter, this Department would prefer the employment of a method by which the gas is applied from the outside of the car.

"Cold Gas" and Pan Method: This method was first described by Bellemare (1). The methyl bromide in 1-pound cans is cooled off with dry ice until it is at a temperature well below its boiling point. Two operators, wearing gas masks and either leather or rubber gloves then enter the car through one door, the opposite door having already been sealed either on the inside or, preferably, the outside. Each man working from one end of the car, the cans are opened with special openers ("beer can openers") and the contents poured into shallow dishes or baking pans, placed at intervals on top of the bags, until the required dosage is obtained. The open door is rapidly closed and sealed after the operators withdraw. This method has been found very effective for obtaining complete control of the insects as long as the pans are placed near the highest points of the bags. Apparently the majority of the gas remains for some time at a low level in the cars, as failures have so far not been reported in the cars with the wooden fasciae described above. Unfortunately, the cooled cans are too cold to be carried in the bare hand and, when gloves are worn by an operator treating a fair number of cars per day for several continuous days, typical "methyl bromide", blisters develop on the thumbs and fingers of the men. These are irritating and take some time to heal up. The formation of these blisters is due to the absorption and retention of methyl bromide in the fabric of the glove.

"Hot Gas" Method: In this case the procedure is similar to that in the foregoing method, but the cans are not cooled and the operator does not usually wear gloves. Usually, also, pans are not used, but if they are they merely serve as a platform on which to set the cans. The cans are opened with can openers or sharp chisels, and immediately a mixture of gas and liquid is forced out of the can, and on warm days this effect is greatly increased. It is impossible to avoid the spilling of some of the liquid on the fingers and here again blisters develop on the hands if more than a few cars are treated. Some operators prop the cans carefully between two bags, others merely stand at the door and throw them towards the end of the cars.

With this method serious leaks of fumigant and failures to obtain control have resulted when used with cars equipped with the roofs balanced on the wooden fasciae, and extra sealing is required to avoid this. Moreover, with the leak detectors tests have shown that some methyl bromide is lost to the open air before the open door can be shut. This method, therefore, is open to very serious objections and should be avoided, especially when a large number of cars are undergoing treatment.

"Can and Applicator" Method: Special applicators (see Figure 7) can be obtained for discharging methyl bromide from the 1-pound

Figure 7. Use of methyl bromide cans to apply fumigant from roof, especially useful in cool weather. (Authors' photo).

cans. By means of a steel spring which binds the can, a pointed steel tube surrounded by a rubber gasket is thrust into the can and the liquid forced out by the gaseous pressure inside the can. Recently "Saran" plastic tubing has been introduced for carrying the fumigant to the point of discharge. These tubes are closed at the end with a copper thread and have small holes punched near the tip to allow the lateral discharge of the fumigant.

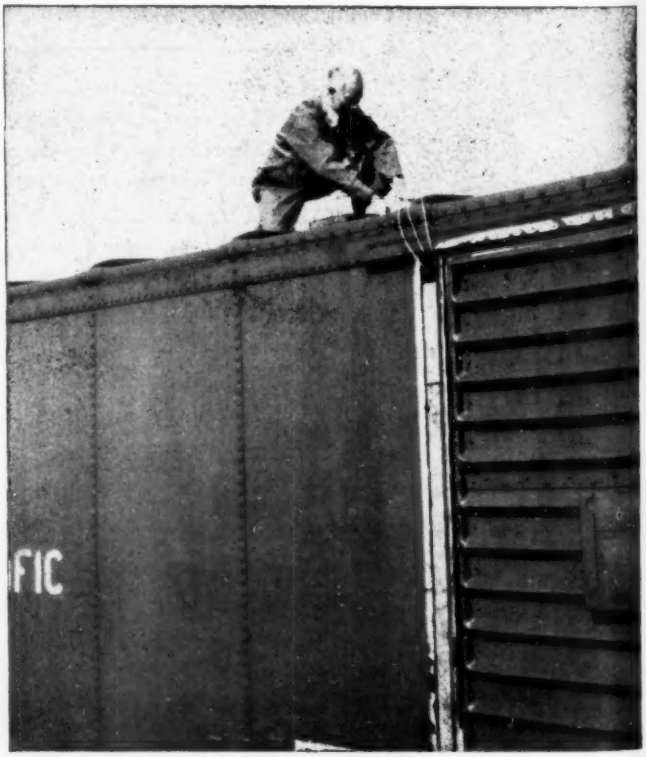

Figure 8. Roof application of methyl bromide, showing position of board in door. (Authors' photo).

As illustrated (Figure 7) a convenient method of using this appartus is to mount the applicators on a small wooden platform to steady the cans against the back pressure of the gas. If the cans are discharged from the top of the car residual gas and liquid in the line drains off more readily, especially in cool weather. One operator devised a method (see Figure 8) of holding the door practically closed by means of a wooden board 4 inches wide placed in the door jamb, leaving a small aperture 6 by 4 inches in area at the top through which the tubes led into the car. The door could then be quickly sealed after the removal of the board.

Saran plastic tubing becomes somewhat brittle when cooled to about 32°F., and it is invariably cooled by the methyl bromide vapour discharged through it. Some care, therefore, must be exercised in handling it under these conditions.

Cylinder Methods: The unmixed methyl bromide can be very readily discharged from cylinders by the positive pressure of the fumigant itself, which is usually increased by the addition of some air before shipment. By attaching an ordinary copper tube of, preferably, 3/16-inch internal diameter directly to the cylinder (Figure 9) the gas can be carried into the car through a small hole

Figure 9. Cylinder method of methyl bromide application. (Authors' photo).

bored in the floor near the door or through the aperture above the board as described in the preceding section (Figure 8). After discharge the hole in the floor should always be carefully filled with a hardwood plug whittled to the correct size. The copper tube should be pinched at the end and several small holes punched near the tip for side delivery of the fumigant. The weight of fumigant required is easily read on the scale holding the cylinder.

In many ways this is the most satisfactory and safest method of discharging the gas, and is the one preferred for recommendation by this Division. However, operators have found the cylinders and scales heavy and awkward to move around in a railway freight yard, and, during recent years, there has been a shortage of cylinders.

The proprietary fumigant "Proxate" is discharged from 50-pound cylinders containing approximately 3.5 lb. of methyl bromide and 46.5 lb. of carbon dioxide. It is claimed that the carbon dioxide adds to the effectiveness of the fumigant, permitting lower doses of methyl bromide. This effect has never been confirmed by us in practical application, but there is no doubt that the carbon dioxide aids in the rapid diffusion of the toxic agent. However, in cars which are liable to leak, especially through the roof, failures have been recorded. This matter is discussed more fully under "Results." "Proxate" is usually discharged through holes bored in the floor ofthe car, so that both doors can be fully sealed before application. In very tight cars this fumigant mixture can often be observed discharging excess pressure by distending the paper sealing material, and thus sometimes some re-sealing is required. The entire contents of the two cylinders are discharged for each car, giving a dose of approximately 7 lb. of methyl bromide per car.

Ventilation and Inspection

The fumigation treatments were invariably made overnight, with exposure periods of 16 to 24 hours. At the end of treatment both doors were opened wide and the cars were not entered for at least two hours. Under most summer conditions this was sufficient for the dissipation of the gas from the body of the car, and only mild reactions for methyl bromide of approximately 50 parts per million were recorded among the bags towards the end of the cars. As might be expected, weather conditions influenced the ventilation of the gas considerably, and a number of different effects were observed, the more important of which are listed herewith:

(1) On warm windless days the gas dissipated rapidly from all parts of the cars and most quickly in the absence of extensive cloud cover.

(2) On very windy days, either cold or warm, when a strong draught of air crossed the middle of the cars. the gas was sometimes "pocketed" at one or both ends of the cars.

(3) In cool damp weather and during rain the gas took often considerably more than 6 hours to dissipate completely from the free air space in the cars. In Vancouver, B. C., during the night, October 2nd and 3rd, rain and fog was continuous and there was no wind. A car of peanuts under observation was opened up at 2 p. m. on October 2nd when the outside air temperature was 56°F. and that in the free air space of the car 62°F. During the night these fell to 58°F. and 53°F., respectively, and rose to 59°F. in both cases when due for inspection at 2:00 p. m. on October 3rd. The temperature in the peanuts was 65°F. 22 hours after opening. At this time the rain and fog were still prevailing. Tests with the leak detector showed methyl bromide present in the free air of the car to be 35-50 parts per million only 4 to 6 feet back from the opened doors, 24 hours after both doors had been opened.

The above examples demonstrate most forcibly the danger of following any hard and fast rules for natural ventilation. Climatic conditions, with their attendant air currents, have a very marked and variable effect.

During 1944 each car of produce was examined by an inspector of this Division before being released. Some samples of peanuts from each consignment were also taken before and after treatment for checks on quality and residue. These matters are discussed further under "Results."

Results

Mortality of Insects

Of the 878 cars which were used to treat plant products during 1944 only 15 treatments were rejected for failure to produce a satisfactory kill of the insects found in the produce.

In warm weather the insects were sometimes found in considerable numbers on the outside of the roofs and walls. These insects could, and did, migrate back into the cars during the ventilation process. Also, occasionally, insects were found flying from cars awaiting fumigation, and undergoing sealing, to cars being ventilated on an adjacent track. These movements back into ventilated cars seemed to be confined to a very small number of individuals and were of no consequence as they were not responsible for any fresh outbreaks of the pests.

Cotton seed meal tends to pack very thickly in the bags, and it was thought that some difficulty might be encountered in gaining penetration. However, with a dose of 2.5 lb. per thousand cubic feet and a 36-hour exposure at summer temperatures complete control was obtained in the cars.

The record of 15 failures includes 13 due to unsatisfactory cars, a situation which, in view of wider experience, could be avoided by additional sealing of those cars which can be made more airtight or by rejection of cars now known to be structurally unsuitable for fumigation under any circumstances. The two failures due to faulty method came about through the use of the 1-pound cans and the Saran plastic tubing by an operator who was not familiar with their use. Here again additional experience will obviate such failures.

In 1944, from 53 of the cars of peanuts successfully fumigated and passed by our inspectors at Montreal (43 cars) and Vancouver (10 cars) 2-pound samples of peanuts were taken to the laboratory and incubated at 80°F. and 60% relative humidity, suitable for rapid development of the species involved. These samples were examined periodically and in only three cases were insects found to develop. Two were from United States cars of doubtful construction treated with the proprietary mixture, and showed a development of **Tribolium castaneum** Herbst. The other was a sample from a sound car treated at Vancouver which showed complete mortality of all stages of **T. castaneum** and eggs and larvae of **P. interpunctella** but in which the only cadelle larva (**T. mauritanicus**) found was a survivor. Control samples removed before treatment showed continued development of the populations. These results coupled with observations made during unloading and storage tend to show that all stages of the insects listed above can be killed during a successful freight car fumigation in a satisfactory type of car.

Effect of Dosage

As already stated, the dose of fumigant and the methods of applying it were left to the judgment of the individual pest control operator. At the beginning of the project, when less was known about the sources of leak and the methods of overcoming them, an over all dose of 10 lb. of methyl bromide for a car of 3,710 cubic feet capacity (approximately 2.5 lb. per thousand cubic feet) was made for treatments with the temperature above 60°F. in both commodity and free air space. With the cars of the best type, as described above, it was found that 6 lb. per car was sufficient, to give a complete kill (approximately 1.5 lb. per thousand cubic feet). Very few treatments were made at lower temperatures, but the operators concerned added ½ pound per thousand cubic feet for every 5-degree drop below 60°F., based on the temperatures at time of application. These doses were usually employed for an exposure of 16-24 hours except in the cars of the cotton seed meal where a 36-hour exposure was given.

Effect of Temperature and Outside Weather Conditions

During the period May to November, 1944, a fairly wide range of temperature conditions was encountered. The lowest temperatures were experienced during the treatment of chicory root to control **Plodia interpunctella** larvae at Halifax on October 30. The temperatures experienced were: Commodity 46-50°F.; in free air of car 32° minimum during night, 50° maximum during day; in outside air 38° maximum and 24° minimum during the night. The period of exposure was 21 hours and the dose of methyl bromide 3 lb. per thousand cubic feet. Careful examination revealed that complete control of all the larvae had been obtained, including those boring deeply into the roots. In the fumigation of peanuts temperatures as low as this were not encountered, but successful fumigations were done at commodity temperatures as low as 52° with outside temperatures of 45° and car temperatures as low as 54°F. From the results of other investigations on low temperatures (as yet unpublished) it is believed that successful results can be obtained at commodity temperatures as low as 20°F. (and possibly lower) as long as the problems of volatilizing the gas can be overcome.

With full sunshine beating on the walls and roofs of the cars, inside temperatures as high as 107°F. have been observed.

Wind velocities as high as 20 miles per hour were recorded during the fumigations. It is concluded that, as a result of extended observations on this point, wind velocity has no effect on the success of freight car fumigation, provided good cars and adequate sealing are employed.

Effect of Fumigation on the Commodities

Taste: No complaints of alteration in taste or processing qualities were received as the result of the fumigation with methyl bromide of imported peanuts and cotton seed meal, and exported chicory, wheat, and chick peas. In the case of the peanuts, manufacturers of peanut butter were contacted in several cities and the statement elicited that the fumigant had had no appreciable effect on taste. Tests in the Fumigation Laboratory at Montreal, P.Q., made on the chicory also failed to show any effect on the flavour of ground chicory.

The fumigated cocoa beans were subjected to a number of severe tests by the importing manufacturers. Samples of cocoa prepared from fumigated material were equivalent in flavour and odour to non-fumigated controls, and cocoa butter prepared from fumigated beans was quite satisfactory in every respect.

Bromide residues: Samples of peanuts from cars fumigated with methyl bromide under ordinary warm weather conditions were submitted to the chemical laboratories of the Dow Chemical Company, Midland, Michigan. Non-fumigated controls were found to contain 0.0004 per cent of total bromide, while those fumigated in the cars at a dosage of 10 pounds of methyl bromide per 3,000 cubic foot car, or 100 pounds of "Proxate", gave bromide residues of 0.0009 and 0.0010 per cent respectively. In the case of a repeat fumigation in a poor car treated first with the pure methyl bromide and then with the "Proxate" mixture, the final residue was 0.0015 per cent of bromide.

In the case of the cocoa beans, in 1942 samples of Accra and Lagos cocoa beans atmospherically treated with one pound of methyl bromide per 1,000 cubic feet for 24 hours at 66°F. in a steel vault, were analyzed both in our Montreal Laboratory and by the Dow Chemical Company. In both analyses the non-fumigated controls were found free of bromide residue, while in the treated samples our analysis gave 0.0008 per cent bromide and that made by the Dow Chemical Company 0.0011 per cent for the Accra beans and 0.0020 and 0.0019 respectively for the Lagos beans.

The question of bromide residues in fumigated foodstuffs has been fully discussed by Dudley and Neal (2) and Monro and Delisle (3). In view of the findings of Dudley and Neal it is not considered that residues harmful in any way to human consumers could result from the treatment of foodstuffs usually encountered in freight car fumigation work.

Summary

1. A description is given of a successful campaign to prevent the spread of stored product insects found in imported plant products. The infestations were eliminated chiefly by fumigation with methyl bromide in steel freight cars at the port of importation or at destination.

2. An account is also given of freight car treatments of exported foodstuffs prior to loading on board the steamship.

3. With the selection of suitable types of steel freight cars satisfactory control of several species of stored product insects was obtained in cocoa, shelled peanuts, wheat, in bags, chick peas, and cotton seed meal. In most cases complete mortality of all the insects present was obtained.

4. The methyl bromide fumigation appeared to have no adverse effects on the products treated and residues analyzed in fumigated peanuts and cocoa beans were of no toxicological significance.

5. For steel freight cars of airtight construction a dose of 1.5 lb. of methyl bromide per thousand cubic feet is recommended for exposure periods of 16 to 24 hours at temperatures of 60°F. and above. A graduated increase in dose for lower temperatures is provisionally suggested.

Acknowledgment

We are indebted to Mr. H. G. Carmody of the Toronto Office of this Division for preparing the illustrations for Figures 2 and 3.

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WARTIME AVIATION QUARANTINE

By **W. M. HERMS**, *Agricultural Extension Service*
College of Agriculture, University of California

Editor's Note: The following paper was read at the recent meeting of the Northern California Pest Control Association held at the Senator Hotel in Sacramento, Calif

IT is a pleasure and a privilege to speak before this organization at your regular meeting.

At present most people prefer to forget the war and go ahead with the business at hand. However, because of your interest in Pest Control I hope some of the things I have to say will indicate to you the relationship of my subject (the introduction of new species of insects in wartime) to your present business.

Now to the subject of this paper, "Aviation Quarantine." In presenting this subject I wish to provide some historical and geographical background.

Historical

The word quarantine as you know is derived from the Italion word "quarantina" meaning a period of forty (40) days. In other words all ships coming into Italian ports in the early days were isolated and placed under quarantine for forty days. We have come a long way since that time in types and speed of transportation. Also great progress has been made in our methods of prevention of disease and particularly control of disease-bearing insects.

Where surface travel for example from the Philippines or the Orient was measured in months and days, now with aviation this same distance is covered in hours and minutes. Where most adult insects such as mosquitoes for example, would most probably complete their life span or be destroyed on a long ocean voyage, these same insects can now travel by plane intact and can be taken alive from such planes as our records show.

Geographical

If a map of the Pacific Ocean Area were placed before you on which were indicated the names and locations of the various endemic tropical diseases, you would find such familiar names as malaria, filariasis, dengue fever, the dysenteries, cholera, scrub typhus, plague, encephalitis, yellow fever, yaws and a number of others. Scanning these again we find that they are largely insect borne diseases. The mosquito is the vector of malaria, dengue fever, filariasis, yellow fever and encephalities. Filth flies are mechanical transmitters of cholera and some of the dysenteries, the flea transmits plague and so on down the line. With American personnel deployed over most of this vast area and insects playing a major role in disease transmission, I think you can visualize the problem. Insects were playing a major role in the Pacific war and constituted a threat to the successful prosecution of campaigns.

In further examining a map of this kind we find that certain island groups and areas do not have the anopheles mosquito, but the threat of introduction was ever present. Also certain sections or islands would have dengue fever and its vector, while adjoining islands also with the efficient vector would not have an epidemic; a comparable situation prevailing with dysentery. This created a situation where those concerned with environmental sanitation including insect control were sitting on a powder key which might explode at any time and sometimes did.

Military Responsibility

The Navy in World War II, largely because of enorous aviation development, was required to maintain a considerable number of land base installations in addition to its ships afloat. This was a relatively new procedure for this branch of the service. With this development came new problems and one of them was "How to prevent the spread, particularly of insect borne diseases and their vectors, from base to base and island group to island group."

A three-man Commission representing Army, Navy, and the United States Public Health Service, after a world-wide study of these problems, laid down certain general aviation Quarantine procedures which were similar for Army, Navy and the Public Health Service. The fundamentals outlined by this commission were essentially those already in use in the Pacific.

The Navy early realized the potential hazard of insect transmission and disease spread by plane, and set up a cooperative program with the existing agencies. Later when traffic became heavy and personnel short, these agencies asked the Navy to carry on. When this occurred a four point Navy Aviation Quarantine program was set up.

Essentially these four points were:

1. Quarantine of Personnel; 300,000 passengers, 1944-1945 fiscal.
2. Plant and Animal Quarantine.
3. Plane Quarantine (Plane spraying); 3300 airline miles in system.
4. Base Sanitation.

The Aviation Quarantine Program

To elaborate on each of these four points in relation to the goal of disease prevention—

1) Quarantine of Personnel — Some of the precautionary measures taken to keep at a minimum the spread of tropical diseases by personnel included:

a) **Medical Certificates** were required on all passengers traveling by the Naval Air Transport Service Pacific Wing (N.A.T.S.), thus covering better than 90% of all transoceanic pasengers carried by the Navy. This later was modified to allow personnel to move from the Hawaiian Islands to the Mainland without certificate. Flight personnel were under the surveillance of the flight surgeon.

b) **Immuization** was required for protection against certain tropical diseases, the requirements varied depending upon the area to which the individual was destined.

c) **Aircraft Quarantine Declarations** were required on all N.A.T.S. planes arriv-in Pearl Harbor. Clearances were issued on planes departing from Pearl Harbor. I will comment more on this point in a moment.

2) **Animal and Plant Quarantine:**

The shortage of trained men and time did not allow a selective agricultural and animal Quarantine, consequently an embargo was placed on all plant and animal introductions by plane from the south or west. The Bureau of Entomology and Plant Quarantine handled plant inspections to the mainland with aid of the Navy.

Because the Hawaiian Islands at that time were the focal point for all trans-oceanic aviation traveling from mainland to the west and vice-versa the baggage inspections were accomplished at Honolulu. It was here that the main barrier was set up to stop the flow of agricultural pests in either direction.

3) **Plane Quarantine:**

a) (Spraying of Planes) at the outset in an effort to have an effective safe-

3 DDT Preparations for the Insecticide Manufacturer

Today Penn Salt technicians are applying just as much effort and skill to the development of DDT as they did during the war. Only now their products are for all of us to use, and their purpose is not the stamping out of typhus in Italy but the controlling of insect pests here at home. A number of new preparations have recently been put on the market which are designed for the use of manufacturers creating their own formulations for domestic and farm insecticides. Here are three which may be just what you are looking for:

PENCO DB-50

—a specially compounded dry powdered dust base containing 50% DDT. This product is designed for use by insecticide manufacturers in the formulation of finished dusts for agricultural and household purposes.

PENCO SOLVENT CONCENTRATE

—a specially developed concentrate designed for use by insecticide manufacturers who do not desire to work from technical DDT. This product can be used for the manufacture of insect sprays.

PENCO DDT-TECHNICAL

—a fine to medium white granulated powder. It has a setting point of not less than 89° C. PENCO DDT-TECHNICAL is used by insecticide manufacturers who make their own formulations of DDT concentrates and finished products.

For prepared sprays use **PENCO WB-50**—a 50% DDT spray base.

PENCO EMULSION CONCENTRATE—a specially developed concentrate for use as a water emulsion spray where a minimum visual residue is desired.

PENCO CATTLE SPRAY—a dry wettable powder containing 50% DDT which is stable in water suspensions.

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guard against insects traveling by plane, a two spray program was inaugurated—spraying upon departure from each island group required. Later as crews and personnel became conscious of the need for this measure only one spraying between island groups was generally practiced. However, the two spray program continued in force almost to the end of the war at Pearl Harbor. The aerosol bombs, one and two pounders were used for this purpose in expended concentrations up to 16 seconds per 100 cubic feet of air space. The length of spray time varied with the type of plane.

b) Collection of insects from arriving planes was considered as routine Quarantine procedure. This was accomplished in so far as trained men were available.

4) **Base Sanitation:**

a) Realizing that a base that was free of insects and disease could not transmit them to another base or island group, insect control and sanitation was particularly stressed. Transient barracks were freed of bedbugs, using D.D.T.; flies and mosquitoes were controlled by sanitary procedures as well as D.D.T. sprays

b) Inasmuch as **flight kitchens,** which dispense food to all parts of the N.A.T.S. Pacific system, are potential focal source of infection, emphasis was placed on keeping them free of flies and in sanitary condition.

c) One method used in checking the efficiency of our work was by placing the New Jersey **light trap** at various strategic places, such as air bases and ports to aid in intercepting possible introductions. A mass of local material was trapped. Over nine hundred mosquitoes mostly **Culex quinque-fasciatus** were trapped at one location in one evening. An analysis of all this material would be interesting. The Hawaiian Sugar Planters Association Entomologists have analyzed some of these findings.

Entomological Phases of Quarantine

The development of the entomological phases of an Aviation Quarantine procedure is based on the premise that insects **do** travel by plane.

On records and collections made by the Navy Entomological Unit No. 51 at the Naval Air Station Honolulu in over a year's time, it is known that insects do travel by plane and sometimes in considerable numbers. In a recent letter from one of the boys in this unit he wrote that they had made what they believed was a record catch, namely seven hundred insects from one plane. It is true that many of these insects are not harmful either from a medical or an agricultural standpoint but there is a large enough percentage of dangerous pests traveling to make those who are concerned with the security and health of the nation and its agriculture to be justifiably concerned.

An example of the possible danger or better still the value of an Aviation Quarantine program is the fact that from collections also made by the above named unit ten species of mosquitoes not present in the Hawaiian Islands were collected from arriving planes in numbers. Also flies in large numbers were intercepted on planes originating from known cholera and dysentery areas.

In addition other insects not endemic to the Hawaiian Island groups were continuously brought by plane. Almost without exception all specimens collected from planes were dead indicating the effectiveness of spraying operations. It was not our function nor was there time to conduct research on the significance of the the introductions above mentioned. However, a partial tabulation of the mosquitoes according to genus and species which were found on planes during a limited period are as follows: **Aedes: Taeniorhynchus, vigilax, albopictus; Anopheles: punctulatus; Culex: annulirostris, jepsoni, quinquefasciatus, pipiens, tarsalis,** and **sitiens.** Inasmuch as there were considerable numbers of dead unidentified specimens it is safe to assume that this list for this particular port of entry could be much larger.

Tribute to Aviation

What I have said is no indictment against aviation. The record of aviation in this war is clear. The flying of needed medical supplies (penicillin, whole blood, plasma, etc.) with the subsequent saving of lives is a proud saga of aviation.

Again I wish to express my appreciation for this opportunity of being present with you. Good luck in your fine work of 1946.

Tells of a Rat Invasion

California Rancher Says He Kills 820 Rodents in Battle

Sacramento — Adolphe Bufe, Wilton farmer, counted 820 dead large rats today, following a fantastic day and night battle.

Aided only by a dog, two cats, a can of poison and a club, Bufe said he struggled a day and night to save his flock of fifty chickens from the "invaders" and, though exhausted at the end of the fight, he said he was successful.

Bufe said he was working in his ranch yard when he glanced over to a hay field.

"Coming up the hill across the hay field was a gray horde of rats—first singly, then by twos and threes, and then in droves," he said.

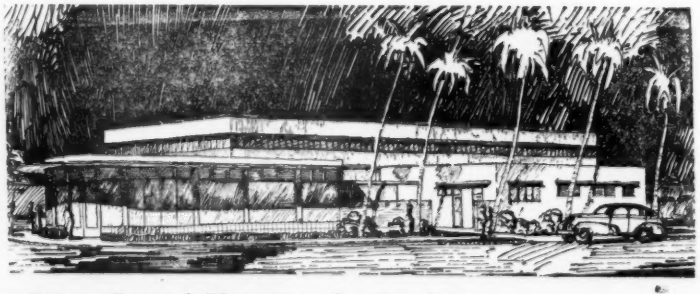
"Not bothering to go around the hay shocks, but over them, they headed straight for my ranch buildings."

Bufe said he ran into a chicken barn, emptied all the feed from the hoppers and substituted a quick acting rat poison, then armed himself with a club.

The rats ignored Bufe, his dog and cats and swarmed into the hoppers, devouring the poisoned food. They were soon running around crazily, Bufe said, and he went to work on them with the club, while the dog and cats chewed them.

All day and night they fought, with wave after wave of rats appearing. Suddenly the migration stopped.

New Hawaiian Chemical Building



Benet Costa, General Manager of the Kills 'Em Chemical Co., Ltd., of Honolulu, Hawaii, announces the removal of the company to its new $100,000.00 plant located at Sheridan and Makaloa Sts., in the Waikiki area.

The new quarters are modern in all details, covering 12,000 sq. ft. on a 30,000 sq. ft. site, including general offices, warehousing, and a mixing plant; and is Hawaii's largest Pest Control and sanitary chemical company.

Kills 'Em was established on Feb. 19, 1941, by four brothers (George, Louis, Lawrence and Benet Costa) with a capital of $7,500.00. Today's capital is $100,000.00.

Kills 'Em expects to be producing and distributing some 56 separate sanitary products throughout the Hawaiian Islands. It also plans branches in Manila and Shanghai.

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The Relation of Commercial Pest Control Operators to Community Sanitary Programs*

By ELMER A. KUNTZ, *Lien Chemical Co., Chicago, Ill.*

COMMUNITY sanitary programs present a composite picture in which all the components must be brought into proper perspective.

My entire thought and effort shall be directed toward promoting mutual respect, understanding and cooperation between local governmental agencies and the commercial pest control operator, to the end that really effective and long lasting control of the always destructive, and many time deadly, rat may be assured.

We may not always be able to see eye to eye, but at the very least, we shall have made the attempt to avail ourselves of the best knowledge and experience available and shall have a common meeting ground to discuss the many varied problems incident to effective control over large areas.

I speak not alone as a commercial pest control operator but as one who has had actual experience in community rat control.

Because of this experience, I was priviliged to learn much about this type of undertaking and the mistakes and pitfalls to avoid to insure maximum success. In addition, as a member of the Rodent Control Committee of the N.P.C.A., is is my duty, together with the other members of the committee, to study all angles of rodent control, including perusal of many plans, ordinances, etc., from all sections of the country. Attempting to extract all that is good and discarding all that is bad, or perhaps, irrelavant, is no easy task, but as a result of our work, we were able to formulate the basis of "A Model Area Rat Control Plan" which we hope to have available soon for any governmental agency interested in rat control on a large scale.

First and foremost, one or more commercial pest control operators should be on any committee entrusted with the responsibility of formulating plans for community pest control programs. The mystic "Pied Piper" of the past has been replaced by the serious, practical and scientifically trained operator of today who is an invaluable contribution to community sanitation efforts. There is hardly any phase of this type of undertaking that is not thoroughly understood by the competent commercial operator. Why not use his knowledge and skill?

What I am about to offer you is in essence, the consensus of opinion as to how best to insure satisfactory results, with due emphasis on the part to be played by all cooperating.

First and Foremost

What are the most important governmental functions?

Where and how can the P.C.O. be of most help?

To determine the answers, let me first list, in order of importance the various activities necessary to the formulation, development, and actual carrying out of a successful community rat exterminating project:

1. **Garbage and rubbish** (Government function)
   (a) Storage
   (b) Removal
   (c) Disposal
2. **Education** (government and civic functions) P.C.O. cooperating
3. **Inspection** (government function)
4. **Rat Proofing or Rat Stoppage** (Cooperative function)
5. **Enforcement** (government function)
6. **Killing** (Under direct supervision of experienced operators)

Amplifying Point No. 1—Garbage and Rubbish—a governmental function.

Before even undertaking any large scale community rat control project, a general survey of existing conditions relative to garbage and rubbish storage, removal and disposal must be made, to the end that necessary remedial measures may be adopted and enforced. This survey should be made by competent inspectors, reporting improper storage of garbage in bags, paper, boxes, baskets, wooden barrels, etc., or the promiscuous dumping and scattering of garbage and rubbish in streets, yards, alleys, vacant lots, etc. Violation must be made a penalty and suitable laws enacted and enforced to secure compliance.

The best containers still seem to be galvanized metal cans with tight fitting covers. Enough cans must be available on each premise to avoid overloading and spilling. Concrete boxes with metal doors at the bottom have the following disadvantages:

1. Steel door openings get clogged, are difficult to close tightly, and also rust away.
2. Garbage must be shoveled out and many scraps are therefore left lying around.

Having determined proper garbage storage methods and facilities, we come to the question of **removal.** Sufficient hauling equipment and manpower must be available to insure **frequent** and **regular** removal and to prevent overloading, spilling, and promiscuous uncovered accumulations.

However, after removal, we have still one very important function left —**Disposal.** How shall it be done? **By incineration?** Unquestionably the best method of disposal. **By dumps on the edges of town?** Dumps are vile, unsightly and smelly and are perfect breeding places for rats, flies, etc. By delivery of garbage to close-in farmers to spread out as feed for hogs, etc.? This has many of the same disadvantages as dumps.

Settle all problems of storage, removal and disposal of garbage and refuse **before** the start of a rat project, else most of your efforts will come to naught.

Point No. 2

Education and Publicity (Cooperative function)

Education and publicity should be well and intelligently planned **in advance.** Your local pest control operators can be of great help in this phase of the work. The U. S. Fish and Wildlife Service, U. S. Public Health Service, Universities and Agricultural Experiment Station and Entomologists will also be glad to be of service for education, publicity, and practical help and guidance. The National Pest Control Association hopes to have available soon a supply of educational pamphlets which should be of great help in securing the cooperation of the citizens of any community. This pamphlet will stress what people can and must do to help.

*Presented at the First Short Course on Pest Control for Sanitary Inspectors, Purdue University, Lafayette, Indiana, April 29-May 3, 1946.

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Yes, there's bad news in Rodentville tonight. Antu's here and Powell's got it—plenty of it! No other rodenticide gives you all these Powco Brand Antu advantages—

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4. **Non-irritating to the skin.**
5. **Grey color. Meets state and federal requirements.**
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This sensational new rat killer—alpha naphthyl thiourea—is the most lethal, most acceptable rodenticide ever developed. It is comparatively safe to humans. It is easy to handle and easy to use. Standard bait formulas require as little as 1 to 3% concentrations. Powco Brand Antu is standardized biologically and chemically for your protection.

As a contact poison, Powco Brand Antu can be packaged in dust guns or shaker top cans. Dusted in rat burrows, holes—wherever rats are in evidence—Antu is quick (12 to 48 hours), deadly and effective.

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Newspapers should be urged to give plenty of publicity to the project, through feature articles, reports of progress, etc. Radio publicity is likewise helpful through speakers, dramatizations, etc.

A citizens committee should be appointed to assist in the Educational and publicity work and speakers should be available to appear before civic, community, and business organizations, schools, churches, clubs, etc.

No project will attain much success without plenty of publicity which, of course, includes education.

Point No. 3:

Inspection (government function)

This is **strictly** a government function and of the utmost importance. Before intelligent inspections can be made, it is fundamental that all those entrusted with this most important service be thoroughly familiar with all phases of the factors which contribute to and help maintain the unwelcome rat population. We have already covered the smelly garbage question. The inspection force must be constanly on the alert to discover and report all violations or evasions. But there are other things that are also of extreme importance, for instance, knowledge of the rat, its life history and habits. Knowing this, inspection can be made intelligently. What do you look for to determine rat infestation? Live rats? Not so easy to see, even in heavily infested areas, due to their nocturnal habits, slinking evasiveness and avoidance of light or open spaces. How then to determine their presence? There are a number of indications that can be noted by well-trained, observant inspecetors:

Droppings—If fresh, are glistening black and soft, if older, dull black and hard, if very old, dull gray and very hard.

Dirt Markings or smudges on base of walls, around pipes, etc., made by the rats as their bodies come into contact with walls, ceilings, pipes, etc.

Rat Damage evidenced by holes gnawed in boxes, bags, containers, as well as floors, baseboards, etc.

Rat tracks in dust, sand, etc., having the appearance at first glance of bird tracks, but in most instances showing also the long markings made by the dragging of the rat tail. Rat holes can easily be found by sprinkling talcum, white flour or other light substance on floor and then tracing the foot and tail marks to the point of entry into the buildings.

Rat holes, inside and outside of buildings. In most cases, prevalence of rats on premises can be traced to external conditions. Therefore it is important to note and report conditions in and dajacent to rat infested buildings. Many bad infestations can be cured by proper attention to **external conditions.** Remember, the Norway rat is a **burrowing** animal. It is just as natural for this rat to burrow into the ground as it is for a bird to fly. Although there are two other species of rats found in this country which are not necessarily burrowing rats, the Alexandrinus (gray) and rattus rattus (black), they are seldom, if ever, found in northern climates and are therefore of no importance to us here. They are commonly known as roof rats and in southern climates climb to the tops of buildings via drain pipes, vines, close-in trees, etc.

Returning to the discussion of the Norway rat which is our particular problem, it follows that treatment of their **burrows** is of utmost importance. Get at the **source** of infestation and you will have made real progress in the problem of elimination. So to the inspection force, I would say, "read, study, and avail yourself of all possible knowledge of rats and their habits if you would become really proficient."

Point No. 4:

Rat Proofing—Here again, knowledge is the greatest asset of a competent inspector. Survey all premises carefully to find points of ingress and egress for rats and make proper and efficient recommendations to owners or occupants of rat infested buildings. Only governmental agencies can make inspections, so the inspections to determine need for rat proofing are a function of the local governmental agencies. However, many pest control operators now do actual rat proofing work and because of their experience can do a more satisfactory job than ordinary contractors. If no local PCO's are available to do this type of work, then reputable local contractors should be hired to do the necessary work and the cooperating P.C.O.'s can render invaluable service by helping determine proper rat proofing plans or suggestions.

Enforcement is the next important phase and again this is strictly a governmental function. No one else can be given the function of enforcement. Here again preliminary search must be made for all laws that may or can be invoked. If proper laws are not on the books, they should immediately be determined and enacted and the law enforcing machinery be put in readiness. There should be on the statute books, an ordinance legally recognizing the rat as a pest. In many instances, penalties for violation or noncompliance are not severe enough. One suggestion that appears to have merit is that premises may be declared **untenable,** unless and until owners or occupants take the necessary remedial measures to insure compliance.

So far we have discussed in order:

Garbage and Rubbish Disposal
Educational
Inspection
Rat Proofing
Enforcement

What about actual **rat killing?**—point No. 6. Here is where the pest control operator can be of greatest assistance. I will start out by recommending that one or more local P.C.O.'s or Exterminators, as we are commonly known, be chosen to head or counsel the actual exterminating phase of the work. He or they should be chosen on experience, ability, and integrity.

Doctors are called for illness, lawyers for legal difficulties, dentists for teeth extraction, why not exterminators for exterminating? Through their knowledge and experience they will be able to counsel on the various phases of killing to be employed which include: poisoning, gassing, trapping.

Poisoning and gassing are hazardous and should always be under the guidance of experienced and responsible persons. Poisoning involves a knowledge of the various poisons available for use and their hazards, as well as a knowledge of variations of bait to be used. Gassing involves a choice of dangerous fumigants to be used and a knowledge of the proper equipment and precautions to be used to protect life. Trapping is by no means a simple function and is certainly done best by experienced operators.

Summing up, it is my personal belief that actual exterminating can best be done under the guidance of qualified P.C.O.'s while governmental agencies attend to garbage removal and disposal, education, publicity, inspection, and enforcement, with cooperating P.C.O.'s ready and willing to assist in any phase of the community program where, through their experience, they can render valuable service.

FUMIGATION NEWS

SEPTEMBER Kansas City 6, Mo.

Published in the interest of Pest Control Operators and the use of
AERO BRAND HCN DISCOIDS AND CYANOGAS
by the Insecticide Department of
American Cyanamid Company
31-F Rockefeller Plaza, New York 20, N. Y.

1946 Azusa, Calif.

ADVANTAGES OF FUMIGATING WITH HCN DISCOIDS

Fumigating with AERO** BRAND HCN DISCOIDS offers many advantages to the Pest Control Operator. For example, because of their cleanliness and ease of application they save considerable time and labor, factors which are most important when fumigating houses, barracks, dormitories and similar structures.

Hydrocyanic acid has long been recognized as a most efficient and economical all-around fumigant by governmental authorities and other fumigation experts. In HCN DISCOIDS, hydrocyanic acid is available to the Pest Control Operator in the strongest commercial form usable.

HCN DISCOIDS *are quickly and easily distributed and will assure a complete kill of all insect life. They are clean to use, leaving no dust or dirt.*

Hydrocyanic acid is quite volatile, and therefore the gas is readily and completely released from the DISCOIDS. However, in applying them, care should be taken to spread the DISCOIDS out well, in order to expose a maximum amount of surface for evaporation. The DISCOIDS should not be left piled up, as evolution of the gas is thus somewhat retarded.

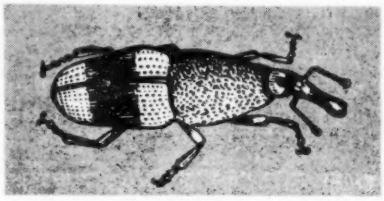
Another advantage of HCN DISCOIDS is that the gas is relatively cool as it issues from the discs, and hence it travels along the lower part of the room first. This is a desirable feature since the infestation is usually concentrated in the lower portions of the room, for example, in the beds and around the baseboards in the case of bedbugs. As the gas assumes the temperature of the surrounding atmosphere, it gradually rises and thus diffuses equally throughout the space.

STORED COMMODITY INSECTS

Rice Weevil

The adult rice weevil is a dull, reddish brown color, and so resembles the granary weevil in appearance and habits that it may often be incorrectly identified as the granary weevil. It is primarily a pest of the Gulf and South Atlantic States, but is introduced into the north in shipments of rice and wheat.

The rice weevil may usually be distinguished from the granary weevil by four light spots on the wings. In its life history it differs from the granary weevil in that it has functional wings, and in the south the female may lay her eggs on standing grain or in the shocks or stacks in the field. Otherwise the life histories are quite similar.



Adult Rice Weevil. Courtesy U. S. D. A.

This pest attacks rice, wheat, oats, corn, barley, sorghum, buckwheat, kafir, macaroni and other hard products. It has also been reported to attack caked flour and meal which is hard enough to afford suitable environment for the larvae.

A satisfactory kill of the general run of these insects infesting plants manufacturing, handling and storing foodstuffs and other commodities, can be made with HCN fumigation. The best method of maintaining control over stored commodity insect pests is through regular periodic fumigation.

CYANOGAS* A-DUST IN RODENT CONTROL

During the past summer, CYANOGAS A-DUST killed more rats than ever before. And the problem of municipal rodent control continues to receive increased attention as rodent control campaigns are being organized in communities from coast to coast.

Aside from their damage to food supplies, which has been estimated to be as high as $400,000,000, rats and the disease-bearing fleas which they carry present a serious health menace in many localities. Traps, poisons and fumigants are all being used in their control. But in the case of outdoor burrows, where the object is to kill large numbers of rats as quickly as possible, CYANOGAS A-DUST is being used extensively. Applied with the Cyanogas Foot Pump, it is a most effective answer to the problem of rodent control. For CYANOGAS A-DUST not only kills rats immediately—*it destroys all their disease-bearing fleas as well.*

CYANOGAS A-DUST is ideally suited for use in many phases of municipal rodent control. It can be pumped into city dumps, sanitary fills and under sidewalks and pavements with amazingly effective results.

Visual evidence of the effectiveness of CYANOGAS A-DUST *in municipal rodent control.*

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NOTES ON DRIED FRUIT INSECTS. 1

By **DR. HEBER C. DONOHOE,** ***Research Director, William Peterman, Inc.*** *(1)*

THE storage of dried fruits presents serious problems concerned with insect infestation. Reports from various sources indicate that these have been especially acute under the conditions of the past several years, involving as they do, overcrowding of facilities, utilization of temporary and poorly-maintained structures, and storage operation by personnel unfamiliar with insect problems. Presumably Pest Control Operators are called upon for aid in combatting some of the problems which arise. For this reason an annotated list of the more-important insects involved in the dried fruit insect complex may be of value. In this list, my chief purpose is to call attention to the insects themselves, rather than to control methods. My readers should recognize from the list that most are well-known in other products. Control methods effective elsewhere, in the main are applicable to dried fruits in storage.

In order that my esteemed friend Al Cossetta will not balk at printing my efforts, they are divided into two separate manuscripts, the first of which continues below. The second, dealing with the Coleoptera attacking dried fruits, will, I hope, appear in an early issue of "Pests."

Phycitid Moths (Family Phycitidae)

Raisin moth, **Ephestia figulilella** Gregson. This species closely resembles the well-known members of the genus **Ephestia**, including the fig or almond moth, chocolate or tobacco moth, and Mediterranean flour moth both in size and coloration. The only certain method for determination, even to the genus is by a microscopic examination of the genital organs.

The raisin moth is the major insect pest of California dried fruits during the season of production and first winter of storage. By the following June it largely has disappeared, due apparently to the action of the parasite **Microbracon hebetor (Habrobracon juglandis),** to competition with other species, and to chemical or physical changes during the ageing of dried fruits which render them unfavorable for this species. Processed fruits in storage, if less than a year old occasionally may be infested by **Ephestia figulilella,** but if older than this never will be more than lightly so. Moreover, preventive and curative measures are so universally applied by the California Fruit Packers that it is rare indeed for infested products to move from their plants into commercial channels.

The raisin moth is a major pest in the dried fruit (including dates) and nut-producing areas of California and is becoming increasingly important in similar areas of Arizona. Its presence has been noted at sea ports in various parts of the world in numerous articles of commerce, including besides dried fruits, nuts, cacao, oat and rice meal, dried insects and many other items, but rarely as anything more than an incidental pest. In California and Arizona it is firmly established as a field insect which feeds and multiplies out-of-doors in a succession of waste fruits and is present in enormous numbers in late summer and autumn during the drying of commercial crops. In general these are heavily infested during drying and only the application by growers and buyers of prompt, effective preventive and curative measures forestalls terrific annual damage.

2. Indian-Meal Moth, Plodia Interpunctella Huebner

As for many other stored foods, the Indian-meal moth is the number one lepidopterous pest of processed dried fruits in storage. It develops on such a varied assortment of foods, and is of such world-wide distribution that, without proper control methods, its presence in every food warehousing facility in the United States may be accepted as a foregone conclusion. Besides the industrial warehouses these include even the small storage facilities of local stores, institutions, and the like, and, the writer suspects, even most, if not all, of the home kitchens and pantries of the nation. As a sidelight, my own residence at this writing literally swarms with adults despite the fact that I have been unable to find any infested food supply. Curiously enough, the adults are most abundant upstairs and not in the downstairs kitchen and food storage facilities.

In California **Plodia** passes the winter in open raisin storages and in boxed dried fruits which occasionally are held in more or less unprotected locations on the fruit ranches, as well as within warmer enclosed storage and packing facilities. During harvest the species frequently is encountered infesting various drying and dry fruits in the field, including figs, raisins, mulberries, cherries and piles of apricot and peach pits. It has been collected widely in malt syrup bait traps; larvae occur in the autumn in the soil beneath date palm trees, in and around ranch storage areas, and often in some numbers, over winter under timbers in the soil beneath open raisin storage stacks. The species was rare in raisins in the vineyards until the autumn of 1934 and thereafter, and, until the writer's studies were terminated by transfer in 1938, it appeared to be increasing rapidly in such locations. Even although true field infestation (i.e. other than in association with drying or storage facilities) has not been proven, it appears that this insect has become thoroughly established out-of-doors in California.

In the storage of dried fruits, much experimental and observational evidence has been accumulated to the effect that these foods increase in quality as food for the Indian-meal moth with increasing age, at least for the first year after harvest. Any except the cut fruits (peaches, apricots, nectarines) as packaged goods may become heavily infested. The "white worms" so frequently reported by housewives and others in purchases of dried fruits probably always are of this species. Cut fruits likewise are suitable food but frequently the surface of these "case-hardens" to such an extent that newly-hatched larvae starve in attempting to feed thereon.

The parasite **Microbracon hebetor** does yeoman service in holding down infestations in California fruit storages and, of course, the same preventive and curative measures as for the raisin moth ensure that fruits entering commercial channels from California virtually are free from infestation.

3. The Almond or Fig Moth, Ephestia Cautella Walker

In the world's literature on dried fruit infestations, this species is recorded widely as the major storage pest. Early publications by the Fresno laboratory made similar records, due, apparently to erroneous identification before studies of the genitalia in 1931 established the pres-

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BALTIMORE, MD.—Reports on Baltimore's three-year, city-wide rat control program show the rat population reduced on the average 90 per cent or better in the treated areas. More than fifty tons of poisoned baits were distributed in over 150,000 private yards, homes, and stores. The poison used in this test was Du Pont ANTU.

ANTU (alpha-naphthyl thiourea), commercially pioneered by Du Pont—is a specific control for the Brown or Norway rat. Du Pont ANTU was the basis for the scientific investigation which led to the discovery of its value as a rat killer.

Of special interest to Pest Control Operators are 2 advantages of ANTU: it's *slow-acting*—its effects begin shortly after exposure, but death follows after 10 to 48 hours; and it is so toxic that a lethal dose is *usually less than 10 milligrams per kilogram of body weight.* Because of the toxic nature of ANTU, it should be used with precautions prescribed on the label.

IMMEDIATE DELIVERY—You can get Du Pont ANTU ready for compounding or for bait preparation in any of several convenient ways. Order from Du Pont now or send the coupon for full details.

HOW TO USE ANTU:

ANTU is an unusually *versatile* rat poison; it can be used effectively in all the following convenient ways . . .

1. **AS A TRACKING POISON**—Du Pont ANTU may be mixed with flour or inert talc, dusted into rat runways or pumped into burrows. Rats pick up the ANTU on their feet, lick it off, die.

2. **AS A BAIT POISON**—mix 1 to 3 parts of Du Pont ANTU with 100 parts of ground bait. Or dust ANTU lightly on and around freshly cut fruit, vegetables, etc.

3. **AS A WATER POISON**—dust ANTU lightly to form a film on the surface of water.

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ence of the raisin moth. Thereafter the writer personally examined over 55,000 adult moths, including many thousands reared from samples of dried fruits, from field and storage areas throughout California and parts of Arizona. The Fresno laboratory personnel both during and since my tenure have examined additional thousands. In no single instance has **Ephestia cautella** been found infesting drying or dried fruits.

This fact is especially curious since **"cautella"** occurs rather widely in storages in the Sacramento Valley as a somewhat serious pest of almonds. Frequently almonds are stored in bags or open bins in close proximity to stored dried fruits. Why this cosmopolitan pest of dried fruits fails completely to attack them in California is a biological mystery. Presumably, however, it is apt to be encountered in processed fruits under storage conditions outside of California.

4. The Dried-Fruit Moth, Vitula Serratilineella Rag.

In California **Vitula** occurs in usually small numbers in packing and storage facilities throughout the State and has been collected in malt syrup bait traps in vineyards. Little is known of its bionomics except that it develops readily on dried fruits. I have encountered no records of its occurrence in storages outside of California.

5. The Dried Prune Moth, Aphomia Gularis Zeller

Larvae of this species individually are the most destructive of any the writer has studied or observed. Full grown larvae are over an inch long and robust. They completely destroy the flesh of individual prunes in their feeding, frequently tunnel for many feet through bins of closely packed unprocessed prunes, and leave behind profuse and conspicuous webbing and excreta. Walls of bins and storage boxes often are badly damaged by larvae boring into and through them during their pre-pupal migrations.

Fortunately the species has been recorded only as a pest of unprocessed prunes and occasionally of stored peanuts and almonds, in a limited area in the San Francisco Bay region. There are no records of its attack on any food product other than the above. None of the details of its bionomics are known.

Miscellaneous Phycitids

Several other species of Phycitids are members of the insect complex in California fruit storages and on fruit ranches. Little is known of their potentialities as pests of stored, processed fruits and they deserve little more than casual mention.

6. The Tobacco or Chocolate Moth, Ephestia Elutella Huebner

Adults are often abundant about raisin storages in early spring and are taken occasionally in the field in malt syrup bait traps. A few larvae have been brought to maturity on raisins in the laboratory but I never have found larvae in field or storage collected raisins. Quite possibly some dried plant material other than fruits is the normal food in the locations noted.

7. The Mediterranean Flour Moth, Ephestia Kuehniella Walker

The comments for the chocolate moth apply equally for this species.

8. Ephestiodes Nigrella Hulst

Adults of this probably native California species closely resemble those of the chocolate moth in size, but generally are much darker colored. For a brief period early each spring these adults make up one of the dominant species about San Joaquin Valley raisin storages. Fairly substantial numbers occasionally are trapped by malt syrup baits in the vineyards. One larvae has been reared from a field-collected sample of raisins. Only because of adult abundance as noted is there any indication that this species is a potential pest of dried fruits.

(1) The information for this article is drawn from the author's experience while a member of the Staff of the Fruit Insect Investigations Laboratory, U. S. Bureau of Entomology and Plant Quarantine, Fresno, California. Mr. Perez Simmons, In Charge, and the other members of the staff, Messrs. Dwight F. Barnes, Charles K. Fisher and George H. Kaloostian all participated, with the writer, in the research background for the notes presented.

Orkin Names Fellton Technical Director

Major Herman L. Fellton, formerly with the United States Public Health Service, has been appointed Technical Director of the Orkin Exterminating Company, it was announced recently by Mr. Otto Orkin, President. During the past five years, Major Fellton has served in the Engineering Division of the United States Public Health Service in a number of responsible positions concerned with the control of disease-transmitting rodents and insects. During this period, he also conducted training courses on the proper use of newly discovered insect and rat poisons such as DDT and compound 1080.

Before that, Major Fellton was engaged at the New York World's Fair as a Deputy Chief of the Health Department with responsibility, among other sanitary engineering functions, for all rodent and insect control activities. During and prior to that period, Major Fellton served as

technical advisor to the Exterminating and Fumigant Board of the New York City Department of Health.

One of Major Fellton's major duties is to conduct a school for Orkin branch managers and operators at which they will be trained in the newest and most effective techniques of rat and insect extermination. This school is located in Atlanta, Georgia, and men are being brought in from other sections to attend. They will have an opportunity to become familiar with the latest developments in equipment and materials. The Orkin Company has taken this action as a means of insuring that their pest control operations are conducted on a scientific basis with full utilization of all new advances in materials or techniques.

The Orkin Exterminating Company is now making available to the general public in the southeastern and southwestern states a complete typhus fever control service, including ratproofing and the use of 1080, ANTU, and 10% DDT powder.

Japanese Beetle Helps Golfer Score an Ace

BALTIMORE, Aug. 5—Fred Heusi and three friends were playing golf at the Mount Pleasant course, and the quartet swears that when Heusi's tee shot on the ninth hole stopped on the rim of the cup, a Japanese beetle alighted on the ball and provided enough impetus to drop it for a hole in 1.

Heusi admitted his score for eighteen holes was 101.

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YOUR PROBLEM	FOR THESE INSECT PESTS				Specially for crawling insects such as cockroaches, ants, bedbugs, ticks, silverfish, lice.
	Flies, ants, gnats, mosquitoes, fleas, ticks, wasps, cockroaches, carpet beetles, moths, silverfish, bedbugs, weevils, cadelle, and other stored product insects.				
	UNDER THESE CONDITIONS				
YOUR PLACE OF USE	On surfaces where *wetting* by water and *visible residue* are not objectionable.	On surfaces where *wetting* by water is not objectionable and *visible residue* is not desired.	On surfaces where *wetting* by water *is* objectionable and *visible residue* is not desired.	For large users who may wish to prepare their own spray mixtures by adding solvents.	On floors and baseboards, in cracks and crevices of woodwork, dark places behind pipes and other places insects infest.
	— USE —	— USE —	— USE —	— USE —	— USE —
YOUR PRODUCT	**DEENOL 50-F** Wettable powder; mix with water, use as spray. DDT—50%.	**DEENOL 25-EM** Emulsifiable oil; dilute with water, use as spray. DDT—25%.	**DEENOL 5-H** Ready-to-use oil spray. DDT—5%.	**DEENOL 25-C** Concentrated oil; dilute with a solvent, use as spray. DDT—25%.	**DEENOL 10-A** Ready-to-use dusting powder. DDT—10%.

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Iron-work in the New Orleans French Quarter

Seventh of a Series of Articles on H.P.C.A.'s 1946 Convention

NO single characteristic of the picturesque French Quarter of New Orleans draws more delighted exclamations from visitors than the delicate, lace-like quality of the wrought and cast iron railings that adorn the balconies which jut over the narrow streets. These exquite mementoes of a past civilization, the attempted imitation of which today too easily reveals the perfection that the art had attained, are largely responsible for the quaint charm of the Vieux Carre.

The most cursory examination of the many examples still remaining discloses the wonderful diversification of patterns on the various homes. Although the same motif may indicate itself in may of the balcony railings it is a rare occurrence when two of the old homes vaunt identical ones. In fact, the constant desire to outdo one's neighbors in the matter of these railings tested the ingenuity and skill of the iron-workers and resulted in many unique and quite often very artistic, designs.

A particular appealing example of iron work which can lay claim both to uniqueness and artistry is that found on a balcony of the David mansion at 620 St. Peter Street, known today as Le Petit Salon. Conceived in good taste, and romantic to the extreme, the bow and arrow pattern is delightful to the eye. Each section of the railing consists of cross arrows joined at the center not by the orthodox bow used to shoot arrows but by a lovers' knot! The romantic motif is apparent, for the arrows point to delicately fashioned hearts decorating the base of the railing while the strip along the top lacks such fanciful foibles.

If one should wonder why the early inhabitants of the city should have gone to the trouble and expense of placing these elaborate decorations on the balconies of their homes, it is only necessary to take a look at the plain exteriors of the French Quarter residences. Since these homes, it is said, were built flush with the sidewalks to insure a maximum amount of shade, in the hot, narrow streets, little opportunity was had to elaborate on and break up the monotony of the flat stuccoed facades. The proud Creoles, themselves fully aware of the interior beauty of their homes, desired that the exterior should have some indication of what could be expected within. The iron balcony railings were the answer to this conceit.

There are two types of iron work in the old Quarter of New Orleans: wrought iron, laboriously forged by hand and converted into magic patterns which threw bewitching shadows along the wooden floorings; and cast-iron, which came into favor at a later date and made possible even more elaborate designs but was lacking the fineness and delicacy of the wrought iron.

New Orleans, a city pregnant with romantic legends and traditions, could not help but weave extravagant stories around the manufacture of these graceful, web-like decorations. Pictures have been conjured of dusky slaves sweating over the heavy forges and hammering the malleable metal into the intricate designs desired by their masters. Or else, it might be the story that the notorious Lafitte brothers, pirate-smugglers, forged the artistic railings in their smithy on Bourbon Street as a front for their nefarious business.

Stanley Arthur, noted authority on New Orleans history, declares both of these stories to be downright foolishness. As a matter of fact there were no known deposits of iron ore near New Orleans in the early days and the metal was either imported from Spain, probably near Seville, and hammered into shape here or else the designs sent over there and the finished product brought back to the city.

An examination of some of these wrought iron railings in the Vieux Carre will readily show that they are of the Moresque design commonly found in Spain. A striking example is the fine, lacy patterns of the balcony railing of the old Gas Bank at 339 Royal Street. For grace and balance, and intricacy of detail, the wrought iron work of this historical old buliding is hardly surpassed within the French Quarter.

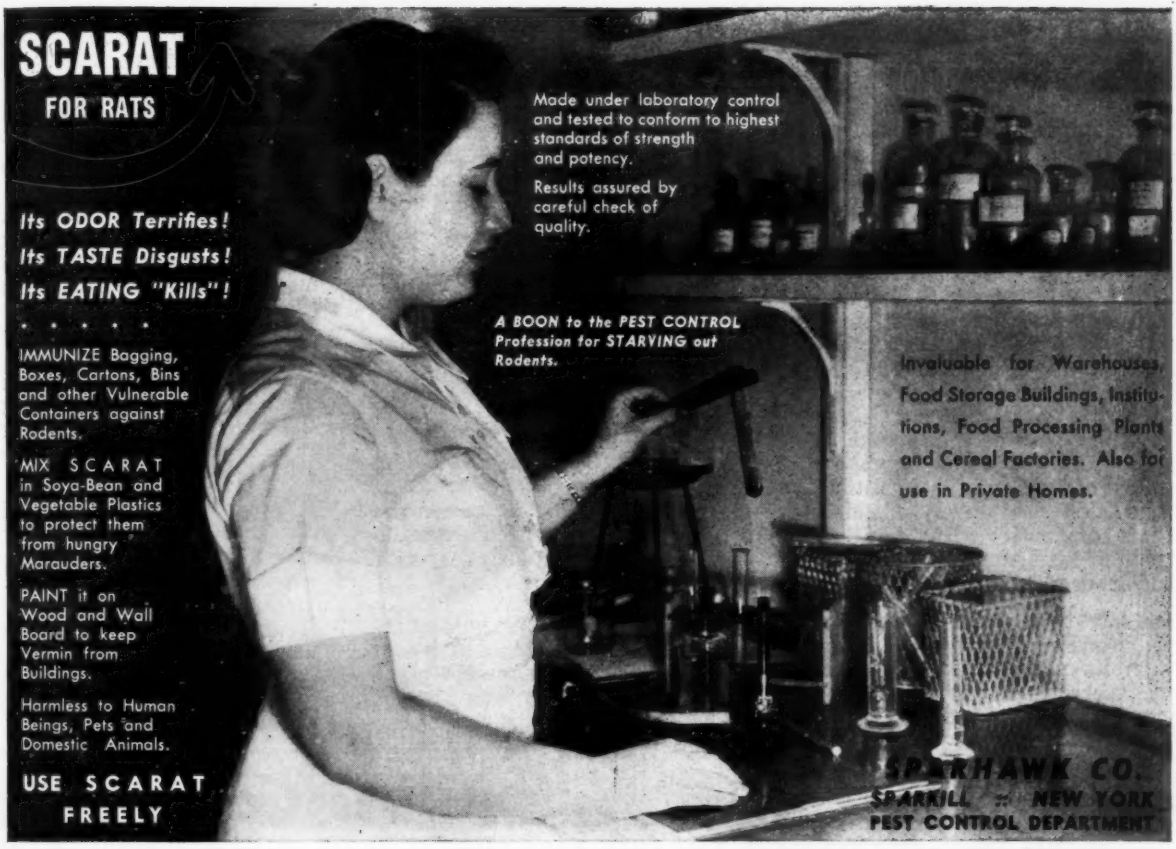
The Louisiana State Bank Building at 401 Royal Street, a two story edifice designed by Lathrobe, famous architect, is enhanced in appearance by the wrought iron work on its balconies. The simple pattern of the balcony railings that extend along most of the front harmonizes with the elegant simplicity of the structure. Hammered into the center of this railing, a smaller one on the Conti Street side, are the initials of the bank, LSB.

It was the custom in the old days to have the initials of the home owner interwoven into a monogram and forged into the railing. Many business house did likewise. When ownership of a residence or business house changed hands the new owner would have the old monogram knocked out and one applicable to him set up.

Another old bank building with some interesting iron attached is that of the Louisiana Bank which preceded the State Bank by a few years. Using the Faurie residence for housing, the bank had to change the structure somewhat to suit its needs and of course did not neglect the wrought iron decoration on the balconies that overlooked busy Royal Street. Of particular interest are the monograms, those at either end being orthodox enough but the center one departing from standard design. Against solid iron are the initials, encircled by a pair of snakes and surmounting two cornucopias spewing forth coins of the realm, are raised in relief. The significance of these symbols is left to the imagination of the reader.

Royal Street is by no means the only one in the city boasting artistic iron work. At the Bartoleme Basque home at 617 Charles Street is an excellent example of the blacksmith's art. Although the graceful Moresque design in itself is worthy of close scrutiny, what catches the eye is the inverted monogram of the proud owner. The letters "BB" to be read must be viewed from the inside of the home. Whatever the cause of this unfortunate slip, the fact remains that the worthy purpose of the monogram was defeated, and passers-by, admiring the delicate lace-work in the days when Mr. Bartoleme Basque, prosperous merchant, resided in the house, went away with the lamentable impression than one "EE" lived therein.

Back on Royal Street, at one time the residence of Francois Seignouret but sometimes known as the Brulatour mansion, one must glance upward to the long balcony on the third floor to see one of the most select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pieces of iron work in the Vieux Carre. The carefully wrought, highly elaborated railing is a notable work of art in its line, but particular attention should be given to the fan-shaped "garde de frico" or guard screen. These devices were necessary when the balcony of one building was flush with that of the adjoining one and access from one to the other was just a matter of stepping over the railing. Jutting from the Seignouret "garde de frico" are numerous, pronged appendages excellently designed to keep unwelcome guests from the Seignouret balcony. Of special interest in this "garde de frico" is the letter "S" incorporated in the design, for Seignouret, considered by many the greatest of New Orleans furniture makers, is said to have always blended his initials somewhere with the decorative plan of his armoires, beds, cabinets and other pieces.

In the late thirties the vogue for wrought iron diminished and cast iron, with its possibilities for more elaborate traceries if not more delicate ones, came into favor. At the same time, local craftsmen ceased to base their designs on the forms of other nations and began to cast about for patterns typical of this section of the country. They found what they sought in the native flora. The tulip, maize, morning glory, rose vine and live oak became the basis of their work.

A quaint, though inartistic, example of the plant design is found in the Cornstalk fence at 915 Royal Street. Made of cast iron, the design of the fence is composed of corntalks growing, apparently, in a field of morning glories. In order to accentuate the reality of this agricultrual motif the fence has been painted in natural colors—green for the stalks, yellow for the ears and blue for the morning glory blossoms. To the design in the gate was added, very naturally, a butterfly.

Scattered throughout the old quarter are many balcony railings which have been designed to simulate plant life. The morning glory was a popular theme and is seen today on many balustrades while others abound with various decorations which, although unidentifiable, are very obviously fruit of some kind. Clusters of grape, however, are easily recognizable.

The cast iron work in the estimation of many does not even closely approach the wrought iron product in beauty, artistry and good taste although there are some notable exceptions such as the railing on the Casa Miro which is quite often mistaken for wrought iron. The principal fault of cast iron railings is in most cases too much iron in them. There are some structures in the Vieux Carre which are almost literally covered with iron work close to the point of gaudiness.

All the iron work in the French Quarter is not found only in balcony railings. There are many gates and fences which offer fine examples of the ironmakers' art. Particularly fine ones are the gates leading into the Court of the Two Sisters. Nor should the Wishing Gates in the Spanish Courtyard, or those of the Patio Royal and Cabildo, be neglected.

Read About The N. P. C. A. Convention

In the OCTOBER Issue of PESTS andTheir Control

—Calendar of Meetings—

Alabama Pest Control Association, semi-annual meeting, September 14 (tentative), Admiral Semmes Hotel, Mobile, Ala. A. S. Krawcheck, Orkin Exterminating Co., Inc., 101 S. 20 Street, Birmingham 3, Ala.

National Pest Control Association (14th Annual Convention), Roosevelt Hotel, New Orleans, La., October 28, 29, 30, 1946.

American Public Health Association (annual meeting), Cleveland, Ohio, week of November 11, 1946. Exhibits will be featured. Willimina Rayne Walsh, Associate Secretary, 1790 Broadway, New York 19, N. Y.

National Association of Insecticide and Disinfectant Manufacturers, 33rd annual meeting, Hotel Commodore, N. Y., December 2, 3, 4 (tentative).

Eastern Branch, American Association of Economic Entomologists, Nov. 21-22, Baltimore. Lord Baltimore Hotel.

American Association of Economic Entomologists, William Penn Hotel, Pittsburgh, Pa., Dec. 9-10-11-12.

Texas Pest Control Association (Annual State Meeting) Dallas, Texas, Dec. 16-17-18.

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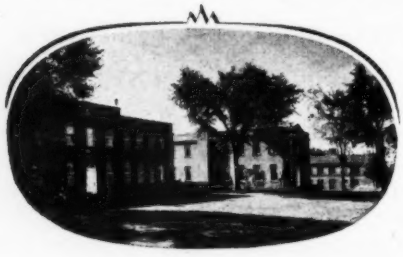

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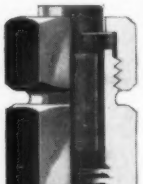

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The Pest Control Operator and What I Would Expect of Him

By G. A. BIEBERDORF, *Assistant Professor Department of Entomology*
Oklahoma A. & M. College, Stillwater, Oklahoma, May 6, 1946

UPON receiving the notice that I was on the program with the privilege of talking on any subject of my choosing, it seemed simple enough but the more thought I gave to the matter, the more difficult became the problem. I thought of rats, mice, fleas, roaches, termites, bedbugs, chiggers, ticks, etc., each of which could easily be the subject of discussion for several minutes. These subjects, however, are old and tiresome to a group such as yours so they were soon discarded. Then two other subjects intrigued me — **The Future Prospects of the Pest Control Operator** and **The Pest Control Operator and What I as a Client Would expect of Him.** After thinking it over, I decided that you were already so far behind with work, that each of you was trying to catch up on this back work and therefore, might be living in the past and not much interested in the future until everything was brought up to date. That, of course, left **The Pest Control Operator** as the subject of discussion.

In this discussion I shall not attempt to evaluate according to importance the things I, as a future client would look for in an operator. The order in which these are presented are therefore arbitrary and the order in which they occurred to me.

Confidence—As a client, I would like to feel certain that the operator has sufficient training and knowledge of his profession so that he is capable of taking over and carrying to completion any problem that is presented. The pest control operator's stock in trade consists of dangerous chemicals and chemical products. The handling of such products endangers not only the operator but also the life of the client as well. Not only is the client involved. but it may even include several families or even an entire community. Consider for instance what might be the result of an explosion of some flamable fumigant in a congested area where conditions were crowded even before the housing shortage. To further emphasize the dangers involved, I should like to mention only a portion of the pest control operator's stock in trade and give you DDT, arsenic, Paris green, barium carbonate, carbon bisulphide, chloropicrin, 1080, nicotine, sodium fluoride, methyl bromide, strychnine, sodium, and potassium cyanide. The list sounds like the "Who's Who of Murder, Incorporated." One certainly would need all the confidence that could be mustered in a person entrusted with the handling of such products, either in the home or place of business.

Stability—The pest control operator has been the victim of unscrupulous and irresponsible individuals who have preyed on the public with but a single thought in mind, viz.: To collect a big bill. These fly-by-night operators have added to the difficulties of the stable concerns and as a result, many individuals have a distinct mistrust for the profession and that mistrust must now be lived down. Fortunately, however, the clientel with whom the operator will deal is prone to forget and will readily accept honest effort and reliable service. I for one would not be interested in an operator who could not show acceptable credentials which included the approval of an Association such as yours, or its equivalent.

Integrity — The operator has for sale a service for which he expects me as a client to compensate him with a certain prearranged fee. To this fee the operator is entitled and should the question arise, he would no doubt have it awarded to him by any court. By the same token, it is equally just that I would expect any promise, either verbal or written, to be carried out by the operator.

Equipment—It is, I believe, not out of line or unreasonable to expect the pest control operator to keep abreast with the times and to use the best and most modern equipment available for the job that is to be performed. Not only is there a great satisfaction in owning good equipment, but it is a pleasure to use and, in the long run, there will be fewer breakdowns. The psychological effect on the client will, I believe, be sufficient to pay dividends. All equipment should not only be the best availalbe but should be adequate for the job performed. The operator who showed up with a three-gallon compressed air sprayer to spray the shrubbery and trees on my forty acre estate (if I had one) would make an impression that **was lasting, but I assure you would not be favorable.**

Work on the Job—I would expect the operator to be neat on the job and show signs of respect for the effort that the client has put forth. There is no reason for trying to make an impression on the client by cluttering up the premises as if he were trying to make that impression by the amount of debris and the chaos left behind. Much more impressive to me would be the operator who was neat and tidy and, may I suggest, even left the premises in better condition than at the time of his arrival. Many of the tasks of the pest control operators are from necessity of such nature that neatness does not readily go with them. In such jobs, greater efforts should be exerted to maintain the set standard. I believe it would be better to take more time and add this to the fee rather than leave the premises topsy-turvy.

The pest control operator's clients in most cases do not become alarmed much until considerable damage has been done by the pest. The housewife whose kitchen becomes infested with cockroaches is entirely too busy attending afternoon bridge and teas to realize that the unwashed dishes in the kitchen sink, together with the crumbs and other left-overs, are excellent banquets for the roaches. Neither is she aware (nor for that matter cares) that when she calls her favorite grocery for a delivery of eggs, potatoes, celery, etc., that with them are likely to come such pests. When she does finally wake up after seeing them scamper for cover when the light is turned on late at night, action is frequently demanded on a moment's notice. At such times the operator's services are very much in demand and at almost any price. At such crises, the operator is frequently expected to use all the hocus-pocus tricks in the bag. I would expect my pest man to be most considerate in not only helping me with the problem of eliminat-

"TOX-EOL" for TERMITE CONTROL

TIME TESTED

TIME PROVED!

A large volume Termite Control Operator recently wrote us,

"Used your chemical since August, 1941, with an almost 100% efficiency . . . proud of results."

This is just one out of the many unsolicited letters we are constantly receiving proving the effectiveness of "TOX-EOL."

"TOX-EOL" **Toxic base is chlorinated phenol plus. Is economical and not unpleasant to use. Effective for both wood and soil poisoning. Present cost less than creosote. Shipped in a highly CONCENTRATED liquid saving transportation charges.**

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CRE-O-TOX CHEMICAL COMPANY

Pioneers in the use of Chlorinated Phenols for termite control.

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AMERICA'S FINEST FOR 16 YEARS

Guaranteed to Outwear and Outlast any Other Hose or Money Refunded

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★ **Built for the Job Exclusively**
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Write Today for Price and — FREE SAMPLE

Also Rock Wool Hose and Cyanide Hose

"The Rubber House of the Americas"

BROADWAY RUBBER MFG. CO.
529 East Broadway Dept."P" Louisville, Ky.

PYRENONE (REG. TRADE MARK) HOUSEHOLD SPRAYS

PYRENONE NO. 20 NEW will be available for 1947 sprays. Its use will permit maintenance of the highest standards of performance and agreeableness while keeping costs at a reasonable level.

The fact that it is now possible to make sprays equal in all respects to straight pyrethrum sprays, and far superior to them in killing power and residual effect, at attractive costs cannot fail to dominate industry policies for 1947.

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Larvacide **. . . AND NO CARCAS NUISANCE**

SWEEPING KILLS with light fumigation—a pint or so per 1000 sq. ft. of floor space. Small areas may be treated without mask. RATS are driven out to die on the open floor. ABSOLUTE WARNING cuts accident risk. No fire or explosion hazard. Packaging convenient for any sized job: cylinders of 25, 50, 100 & 180 lbs., also 1 lb. dispenser bottles, each in sealed can. 12 to case. Stocked in principal cities. Write for Booklet P-9 which gives detailed information about Larvacide.

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Available for Prompt Deilvery
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ing the pest, but I should also appreciate having him enlighten me on the possibilities of the source of supply. I would not care for any Pied Piper tricks but on the other hand a reasonable explanation of the procedure and reasons for such procedure. In the end, I would expect to settle for the services by paying a fee which should, of course, be reasonable and not like the frantic individual—just any price.

I should not expect the pest control operator to be able to give me all the answers and be able to solve all the problems at once. I should be very disappointed in him if he were unwilling to admit the lack of knowledge and go on blindly in a hit-and-miss manner on the problem at hand. In case he were unfamiliar with the particular problem, I would expect him to know where to obtain proper information and counsel. Such information and counsel is available to you through such agencies as the U. S. Department of Agriculture, the Bureau of Entomology and Plant Quarantine, The Fish and Wild Life Service of the Department of Interior, and the Oklahoma Experiment Station. These agencies are your agencies and I would expect my pest control operator to use them.

Rats or No Rats, Rent Must Be Paid

The argument that premises may be overrun with rats is no excuse for nonpayment of rent, City Judge Michael E. Zimmer of Buffalo, N. Y. ruled Tuesday. He ordered Mrs. Peter Mancini, second-floor apartment of 48 Seventh St., to pay $15 July rent to the owner, Mrs. Delories Palmisano, first-floor occupant.

"Unless the landlord enters into a contract to keep the premises free of rats or other pests, the landlord cannot be refused his rent for failing to do so," commented the judge. Mrs. Palmisano, through her attorney, Assemblyman Frank A. Gugino, said she was refused payment. In City Ordinance Part of City Court, it was disclosed, Judge Jacob A. Latona last week gave Mrs. Palmisano until Aug. 19 to free her premises of rats after she was summoned to court by the City Health Department on complaint of Mrs. Mancini.

On the radio program "The Answer Man" of April 18th the following questions and answers were broadcast:

Question: "A note from a Freehold, N. J., listener reads: I heard a G.I. say that Arabs call the insecticide, DDT, 'sleeping powder,' but I didn't hear him say why. Do you know?"

Answer: "Yes, the Arabs call DDT 'sleeping powder' because a treatment of it relieves them of lice and enables them to sleep."

Riedeburg and Beatie Advanced By Westvaco

Theodore (Ted) Riedeburg, who joined Westvaco Chlorine Products Corporation early this year, has been appointed Sales Manager of the Agricultural Chemicals Division effective July 1, 1946. In his new position, Mr. Riedeburg will supervise sales of all Fumigants and Insecticides produced by Westvaco including Methyl Bromide, D.D.T., Grain and Soil Fumigant mixtures and new products of a kindred nature to be added to the Westvaco line.

RUSSEL H. BEATIE has been named Assistant Manager of Agricultural Chemical Sales of WESTVACO CHLORINE PRODUCTS CORPORATION, 405 Lexington Avenue, New York, N. Y.

Before joining Westvaco, Mr. Riedeburg was connected for several years with the Dow Chemical Company in the development and application of Methyl Bromide in industrial and food plant sanitation. His services in this field will still be available for consultation with fumigators and sanitation engineers.

Russel H. Beatie, who joined Westvaco earlier this year, has simultaneously been named Assistant Manager of Westvaco Agricultural Chemical Sales, with particular responsibility for Insecticides.

Mr. Beatie graduated from Kansas State University taking his Masters Degree in Entomology and spent several years in technical service work throughout the Middle West before joining the Sanitary Corps, U. S. Army in April 1943. Subsequently, for over three years, he served in the South Pacific being detailed to Malaria Control and Infestation Survey projects in advanced areas.

In his new duties Mr. Beatie will be available for consultation on the selection and application of Westvaco Insecticides as well as the study of infestation programs thereto.

THE MONTH'S GAG

MR. NAUGHTON—"I'm afraid to go home."

TOM HOWARD—"Are you a man or a mouse?"

McNAUGHTON—"A man. My wife's afraid of mice."

"Man's Stance Declines"

"Male posture is suffering an alarming slump," says Guy Richards in Life Magazine.

In Business or Social Life, You Need PERSONALITY–CONFIDENCE–POISE

Everyone desires to know how to develop these outstanding qualities. No other known method will develop these outstanding qualities in such a short time. Three fundamental basic principles in appearing before any group or audience are:

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How to be more forceful in selling yourself to the public . . . How to see yourself in action . . . How to dramatize your abilities.

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1. It is the only book of its kind offered to the public.
2. It will help you develop that power of force that lies within you.
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4. It will help you develop into a dynamic speaker, a quality that you never knew you possessed.
5. It will develop your inherent possibilities faster than any known method.
6. It may be used before any audience or group of friends.

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Controlled by M M & R laboratories for highest quality. A long list of M M & R Essential Oil *Replacements* simulate the natural oils with remarkable fidelity.

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A complete range for every purpose and in various price ranges. Compound perfumes prepared to meet individual requirements.

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Tremendous covering power lasting effectiveness and exceptional economy

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Capacity 4-Oz. Screened Cover

Made of Heavy Durable Metal

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IT PAYS TO ADVERTISE in PESTS

MAGIKIL ANT BAIT JELLY — Easy TO USE

KILLS ANTS

CONTAINS THALLIUM SULPHATE

Packed in Convenient Service Containers

ANT TRAPS, 1, 3 & 7½ oz. Tubes 10 Lb. Jars

Used professionally it assures customer satisfaction.

Preferred by discriminating PCO's.

For safety in service work use MAGIKIL ANT TRAPS.

Lethelin Products Co., Inc.
MOUNT VERNON NEW YORK

A Handy Way To Use Red Squill!

Goes a long ways and does an excellent job.

Spread a thin coating of

LENZ RED SQUILL RAT PASTE

over full slices of bread

then cut each slice into 20 to 25 pieces and you have a bait rats will take regardless of the food they have access to—we all know the value of bread as a bait for rats—sticks tight to any kind of bait—will never harden—spreads like soft butter in any kind of weather—hot—cold—or humid and has a good "come on" odor.

Each pound makes about 400 baits

Cost per bait is low and baits are so handy and effective that any inexperienced employee can do an expert job.
Make the baits right on the job.

Send for the HANDY KIT SIZE and use it on your next job. One Trial Convinces!

Handy Kit Size	RESALE SIZES	
24 oz. can $2.17 *Good for 600 baits.*	6-⅛th oz. can $1	3 oz. jar 50c
In BULK for large users and repackers	1 Dozen ....$ 7.00	1 Dozen $4.00
65 lb. drum 79½c lb.	4 Dozen 26.00	2 Dozen 7.20
6 or more drums 75c lb.		4 Dozen 13.40

With display cards and window banners.

Prepaid if cash accompanies the order.

Lenz Laboratory
Sycamore, Illinois

WRITE FOR THESE BOOKLETS

ELECTRO SPRAYER

The electro sprayer as shown in ad on page 11 of this issue weighs 12 pounds when filled and ready for use. Operates on 115 volt AC or DC outlet. Thermostatically controlled magnetic switch. Flash boiler principle produces instant super heated dry steam. Precision built. Requires no lubrication. Scientifically designed ceramics treated under 2400° F. Specially molded plastics, resistant to chemicals, water absorption and heat. Special pump design for ease of operation. Water insecticide, and steam outlets screened to prevent foreign elements entering vital parts. Fully guaranteed by manufacturer. Super heated dry steam does not dilute the insecticide, it is stated, but acts as a vaporizing, activating and driving force only. Any liquid concentrate insecticide or deodorant may be used in the Electro Sprayer.

Specifications of Tigress Vaporizing Insecticide, for especial use in connection with Electro Sprayer, follow: Peet Grady tested 100% fly kill. Laboratory tested cockroach kill of 92 out of 100. Contains a high percentage of pyrethrum. Toxicants are blended in a carrier base of highly refined mineral oil. No kerosene! Leaves no persistent after-odor; no greasy residue, it is stated. 100% active ingredients. No dilution necessary. No waste.

For complete particulars write: ORGANIZED DISTRIBUTORS, INC., Dept. P, 3125 E. Seventh St., Oakland 1, Calif.

IMPROVED PYRIN No. 20

Technical bulletin discusses Improved Pyrin No. 20 vs. Pyrethrum Extract No. 20. Sesamin as a synergist for pyrethrum, principal characteristics, suggested formulae, roach test (USDA method), etc. Sample on request. John Powell & Co., Inc., 1 Park Ave., New York 16, N. Y.

ANTU-BASED RODENTICIDE

Developed during the war and now released for civilian use, ANTU (AlphaNapthylThioUrea) is the toxic agent of Formula 83, a new rat poison offered by O. E. Linck Co., Inc. Sold on a money-back guarantee, Formula 83 contains both eating and drinking baits. Although each 35c package has a potential kill, it is claimed, of more than 1,000 rats, it is harmless to poultry. Attractively packaged for over-the-counter sale. O. R. Linck Co., Inc., Montclair, N. J.

FOR THE FOLLOWING PUBLICATIONS WRITE WOOD TREATING CHEMICAL CO., 5137 Southwest Ave., St. Louis 10, Mo.

WOOD TREATING CHEMICALS

Leaflet, color-illustrated, describes pentachlorophenol-based wood-treating chemicals available in ready-to-use or concentrated form for wood preservation, termite prevention and dimensional control. Also discussed are such methods of wood impregnation as: vacuum-and-pressure, hot and cold open tank and cold open tank.

Write WOOD TREATING CHEMICALS CO., 5137 Southwest Avenue, St. Louis 10, Mo.

WOOD PRESERVATIVES

Discussed are several products for the control of decay, blue stain, termites, powder post beetles, swelling, warping, checking, shrinking, moisture absorption, grain raising. Illustrated.

HAND-OPERATED HYDRAULIC SPRAYER

A new hand operated all-metal hydraulic sprayer, built to aircraft precision standards, has been developed by the Cornelius Company, Minneapolis, for aerosol-type spraying of chemicals, insecticides, disinfectants, lotions and similar fluids.

An important feature of the new sprayer which measures less than 6" from nozzle to handle, is use of a revolutionary hydraulic principle by which a 300-pound nozzle pressure is built up with a single 2⅛" stroke of the piston.

This pressure, discharged through a special nozzle containing an orifice .006" in diameter, reduces fluids to an aerosol fog, an important advantage particularly in the application of DDT space spray solutions.

Made entirely of brass and stainless steel, the sprayer has neither packing nor gaskets, yet can be operated in any position without danger of leakage, due to specially designed airlock around piston.

The Cornelius sprayer is supplied complete with 8-ounce screw-type glass container (for chemicals, insecticides, etc.). Extra container is included in each package for added convenience when different types of solutions must be kept ready for use.

Details about the hydraulic-aerosol sprayer and its range of applications may be obtained from the Cornelius Company, Dept. P, 1621 E. Hennepin Avenue, Minneapolis, Minn.

SAFETY DOOR LOCKS FOR FUMIGATORS

Reports of fatalities due to individuals having keys to enter houses under fumigation continue, despite the utmost care on the part of the fumigator to prevent them. Designed to prevent just such accidents, the Laing Safety Door Lock is once more available and every fumigator should use this foolproof device. Simple to operate, reasonable in price (quantity discounts), the Laing Lock not only is dispensable in your fumigation service operations but it has resale possibilities as well since it will insure the mechanism lock on doors of boat houses, lodge or summer or winter homes.

R. W. LAING & SON, 2196 Bellfield Road, Cleveland, Ohio.

Insecticide Formulations for Household Livestock, Farm and Industry use.

Brochure contains new information which has become available during recent months on DDT and Lethane concentrates, etc.

Rohm & Haas Co. Dept P., Washington Square, Philadelphia 5, Pa.

NEW M.S.A. INDUSTRIAL GAS MASKS BULLETIN

A new 4-page bulletin describes and illustrates Mine Safety Appliances Company's Industrial Gas Masks for protection against individual industrial gases or combinations of gases, smokes, vapors, and dusts (with the exception of carbon monoxide and illuminating gas.) For many applications the masks are U. S. Bureau of Mines Approved.

The M.S.A. "All-Vision Facepiece," featured in the new bulletin, it is stated, permits unobstructed vision covering all normal viewing angles. Inbuilt fogproof construction prevents moisture condensation on the large, specially-contoured lenses, which are made of shatterproof glass and are replaceable and interchangeable. A minimum of dead air space cuts down re-breathing of exhaled air. The "All-Vision" Face-piece is made of molded special rubber—comfortable and easy to wear. Providing gas-tight fit on any face without "pressure points," the Facepiece insures worker safety and contributes to efficiency on the job.

The M.S.A. "All-Vision" Facepiece is available equipped with a Speaking Diaphragm which insures perfect communication between men, over the telephone, and through speaking tubes.

The new bulletin includes the broad selection of canisters available for use with M.S.A. Industrial Gas Masks, and a comprehensive list of gases against which protection is afforded.

For safety in low concentrations of poisonous and irritant gases, fumes and dusts, the M.S.A. Canister-Type Half-Mask, described in the new bulletin, may be used. The Half-Mask, like the "All-Vision" Face-piece Mask, does not interfere with goggles or headgear, it is stated.

M.S.A. Industrial Gas Masks are furnished —complete with harness, canister, facepiece and connecting tube—in strong carrying cases of hard vulcanized fibre.

For a copy of the new bulletin on M.S.A. Industrial Gas Masks, address this publication or direct to Mine Safety Appliances Company, Dept P, Braddock, Thomas and Meade Street, Pittsburgh, Pennsylvania.

DDT BOOKLET

A new eight-page color booklet has been prepared by the Pennsylvania Salt Manufacturing Company to describe its five Penco DDT products for the agricultural and insecticide industries and give some basic facts about DDT itself.

The booklet explains exactly what DDT is, how it can best be used, what limitations it has and where it excels in insect control.

The booklet contains full instructions for preparing various dilutions of the five products as well as complete instructions for their use, and what insects they control.

WRITE PENNSYLVANIA SALT MANUFACTURING COMPANY, Dept. P., 1000 Widener Building, Philadelphia 7, Pa.

MSA DEMAND-TYPE OXYGEN MASK*

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts, Pittsburgh 8, Pa., announces a demand-type oxygen mask for respiratory protection in unbreathable atmospheres. It is always ready for use and requires no special training or practice for operation: the wearer needs only to put on the mask, open a valve and breathe. One of the two types has an oxygen cylinder on the wearer's back supported by an adjustable harness, with oxygen supplied for an hour of normal breathing. The front sling type has a smaller cylinder for shorter periods. Both provide oxygen exactly as needed by the individual wearer by means of the demand regulator. The mask is equipped with a pressure gage which indicates the amount of oxygen in the cylinder at all times. The breathing tube is quickly disconnectable for conservation of oxygen during stand-by periods. Fogging of the mask's all-vision facepiece is prevented by a flow of cool oxygen over the lenses.

MINE SAFETY APPLIANCES CO., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

The NPCA Fumigation Committee is not ready to recommend the use of oxygen type of equipment on commercial fumigation work. It very definitely has a place in rescue or emergency work. The Committee continues to recommend the use of the canister type mask—Ed.

FOR THE FOLLOWING PUBLICATIONS WRITE AMERICAN CYNAMID & CHEMICAL CO., 30 Rockefeller Plaza, N. Y. 20, N. Y.

FUMIGATION SAFETY RULE

Discussed in this fumigation service letter are helpful instructions in connection with the locking of all doors and accessible windows, placing of warning signs thereon and the guarding of premises during fumigation.

GAS MASKS

Some constructive suggestions on the care and maintenance of gas masks are contained in this News Bulletin.

NEW SPOT FUMIGANT

Leaflet describes Acrylon, a new spot or local fumigant. Very effective, it is stated, for use in treating the machinery in flour mills, bakeries and many other places, particularly for the control of Mediterranean flour moth, confused flour beetle, flat grain beetle, cadelle, and similar insects. Not a contact spray, Acrylan, it is further stated, has no deleterious effect on baking qualities of flour and leaves no residual odor.

FIRE IN A BUILDING UNDER FUMIGATION—PROCEDURE

Is the title of an informative bulletin on the subject. Also included are answers to some fumigation questions of interest to every PCO.

FUMIGATION SAFETY RULE

BULLETIN 80.

EFFECT OF HYDROCYANIC ACID ON FOODSTUFFS

REMOVAL OF PHOTOGRAPHIC FILMS AND PAPERS BEFORE FUMIGATION

BULLETIN 88.

EDUCATE THE DOCTOR IN FUMIGATION FIRST AID PROCEDURE

ELECTRIC FANS HAVE SEVERAL USEFUL FUNCTIONS IN FUMIGATION WORK

BULLETIN 84.

DDT FORMULATIONS BULLETIN DISCUSSES

BULLETIN 94.

FUMIGATOR'S FIRST AID KIT

BULLETIN 93.

DEVELOPMENT OF HCN FUMIGATION

BULLETIN 96.

METHYL ORANGE TEST PAPERS

BULLETIN 95.

MECHANICAL MEANS FOR QUICK VENTILATION OF FUMIGATED SPACES

BULLETIN 97.

ANT BAIT

Circular describes a jelly ant bait with Thallium Sulphate as its toxic ingredient. Sample tube on request.

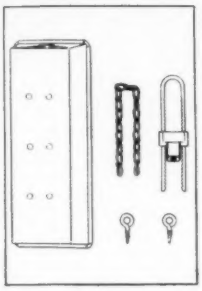
WRITE LETHELIN PRODUCTS CO., Mount Vernon, N. Y.

METHYL BROMIDE

What it is; what it does; how to use it. Described are dosage schedule for various type pests, methods of application and preliminary precautionary measures.

WRITE WESTVACO CHEMICAL CO., Chrysler Bldg., N. Y. C.

LAING'S SAFETY DOOR LOCK



This lock will lock any door. Knob, Latch, Double, Single, Swinging, or Sliding Doors. You do not have to bother with keys to property.

Used by fumigators all over the United States.

Write us for information.

Manufactured by

Laing Exterminating Co.
7700 Carnegie Avenue
Cleveland 3, Ohio

U. S. Patent No. 2134922

MICE-GLUE

GETS MICE LIKE FLYPAPER GETS FLIES

10 lbs. $6.00 25 lbs. $13.50 100 lbs. $45.00

BIRD-REPELLENT

Keeps Pigeons, Starlings and Other Birds from Buildings

10 lbs. $6.00 25 lbs. $13.50 100 lbs. $45.00

PHOSPHORUS-PASTE

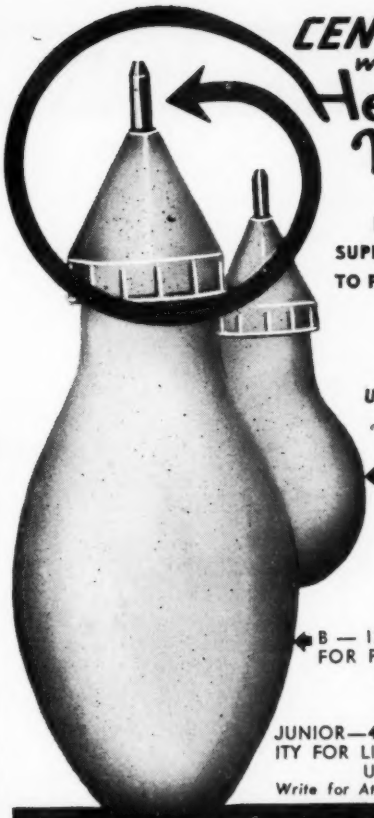
For Rats, Mice and the Large Brown and Black Roaches

10 lbs. $4.25 25 lbs. $9.00 100 lbs. $32.50

PEST CONTROL CHEMICALS CO.

324 Broadway Write for Details BUFFALO, N. Y.

CENTROBULBS WITH THE NEW Heavy duty BRASS TIP Nozzle



EXTENSION NOZZLES SUPPLIED IN ANY LENGTH TO FIT CENTROBULB B AND A.

PEST CONTROL OPERATORS

Use Centrobulbs for neat troubleproof service.

A — 8 oz. CAPACITY FOR LIGHT JOBS

B — 12 oz. CAPACITY FOR PROFESSIONAL SERVICE

JUNIOR—4 oz. CAPACITY FOR LIGHT HOME USE

Write for Attractive Prices

CENTRAL RUBBER PRODUCTS CO., Inc.
821 Broadway, New York 3, N.Y.

GREETINGS N.P.U.A. MAY YOUR FIRST POST - WAR CONVENTION BE THE BIGGEST AND BEST YET.

Our Mr. Dave Weisburger will be at New Orleans and will be glad to talk with convention delegates on matters of insurance interest.

Meanwhile, effective insurance coverage, based on over thirty years experience, may be had in representative AMERICAN STOCK COMPANIES on one or more of the following:

Public Liability (includes "1080" coverage)
Auto Liability . . . Workmen's Compensation
Property Damage . . . Products Liability
Accident and Health . . . All Allied Lines

As Well as Life Insurance and All Forms of Employee Insurance Plans

MEMBER NATIONAL PEST CONTROL ASSOCIATION

Inquiries welcome. No obligation entailed.

B. & D. A. WEISBURGER

Dependable Insurance since 1915

1440 Broadway New York City 18, N. Y.

PHOSPHOROUS PASTE

FOR ROACHES and RATS

SINCE 1874

J-O Phosphorous Paste is so compounded as to eliminate the hazard of fire and possesses advantageous qualities peculiar to itself. A properly made **Phosphorous Paste** such as **J-O** is absolutely safe to use. It cannot burn or set fire to other substances.

Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

For all species of roaches, this product is **UNEXCELLED.**

JOHN OPITZ, INC.

50-14 39th Street Long Island City 4, N. Y.

Manufacturers of Exterminating Products Since 1874

LOCAL ORGANIZATION NEWS

Philip Parsons, Bay Pest Control Co., Burlingame.

Ralph C. Tracy, Golden State Termite, Mountain View.

J. E. Wesley, Kemi-Cal Pest Control, Oakland.

O. M. Wilson, National Exterminators, San Francisco.

The usual Get-together the night before and the Community Breakfast were attended with increased interest.

Nebraska State Pest Control Operators

Nebraska Pest Control Operators met at the Athletic Club July 18. Tentative plans for organizing a state Pest Control Association were discussed as well as other vital pest control problems.

Also the Nebraska PCO's were invited to meet with the Missouri PCO's who will meet at the University of Missouri, Columbia, Mo., August 17.

The following names have arranged to attend the Missouri meeting: Joseph Hahne, Smith Exterminating Co.; Walter Trout, General Manager Federal Termite Control Service.; H. C. Mills, Mills Exterminating Systems; Mrs. Mat Levenson, Levenson Chemical & Exterminating Co.; John Potts Linn, Industrial Pest Control Co., Inc.

Houston Pest Control Association

Rat stoppage themed the meeting of the Houston Pest Control Association held at the Wingate Mexican Restaurant, Houston, Texas, on Tuesday evening, July 9. President H. L. Belle presided. Guests included Captain Hendrix and Captain Schliessmann both of the U. S. Public Health Department, and Dr. Austin E. Hill, Health Director of the City of Houston, with total attendance reaching 40.

Letters from Ted Oser and Bill Buettner, president and secretary, respectively, of the the NPCA, urging sensible rodent stoppage work by the PCO, set the stage for the evening's discussions.

A. Blieden, former member of the Houston Health Department, now a rat-stoppage specialist on a commercial basis, stressed importance of PCO familiarizing himself with various aspects of rat stoppage. He also declared that "1080" will not replace rat stoppage or fumigations and urged that the city do an effective job of inspection and enforcement, with the PCO co-operating by doing rat stoppage in accordance with inspections and ordinances.

Doctor Hill discussed city's experience in performing rat stoppage work, but advised that "the city manager instructed us to close our shop as of August 1, and remain closed for a period of ninety days, to give all the private construction men an opportunity to take over the rat-stoppage work." And at this point he expressed the hope "that enough of you men will become interested in this work to justify our staying out of it from now on," promising that "we will continue our inspection work and will continue to give notices to the property owners to build the rats out of their places and exterminate the rats on the inside."

In reply to a question raised by Mr. Abel several PCO's indicated they contemplated inclusion of rat stoppage as part of their business.

Urging that the PCO's do an honest job and thereby stop complaints about their inefficiency from the public, Captain Hendrix declared "You can do it if you work together and get your ordinances, to get the work done because if one of you attempts to do a building and doesn't do it, that is going to reflect on every one of you."

Mrs. Abel came out strongly "against any type of city ordinance governing control of the PCO, "but indicated the Association was appointing a legislative committee who will draft legislation to be introduced this following January."

Though currently only in the termite control business, Mr. Howell declared "It is a possibility I may enter the rat control business, if I felt that I could go out and bid legitimately on a job and do the job properly as the ordinances call for and not be underbid by somebody else using a piece of thin metal doing the job improperly." The solution, he pointed out, is for the health officials to "enforce the ordinances the way it should be done."

In closing the meeting around 10 p. m. Mr. Belle called attention to the educational program on which the association was embarking at its future meetings, with the first such to be devoted to ants, different types and their controls.

Northern California Pest Control Association, Inc.

The Joint Meeting of the Northern California Pest Control Assn., and the Pest Control Operators of California (Northern Division) was held in San Jose on July 27th 1946.

The Address by John L. Harvey, Chief of Western District of the Federal Food and Drug Administration (to be published in a later issue of Pests) was enlightening regarding the necessity of; the creation of; and the administration of the Food and Drug Act. One very important point was brought out. It was the fact that Food and Drug Administration would hesitate to prosecute a Food Processor whose product contained less than 7 parts per million of DDT. It is the first reference that the presence of DDT in any quantity, would be permitted. Another point that Mr. Harvey stressed was the importance of "EXCLUDING" rats and mice rather than killing them after they have entered a processing plant.

Two "thought-provoking" Office Forms were presented by V. H. Montgomery. One was an Addressographed Invoice whose second 3x5 copy could be used as Accounts Receivable and the third (and if needed fourth) copy would be the Service Card to be the only hand writing record. The other was regarding Method of Bidding. It stressed the importance of getting paid for Sales, Transportation and other Overhead before computing a service charge, which in the past, might have been based on the time and material used on the job only.

Mr. C. Banta of the Banta & Driscoll Company of Compton, presented Practical Methods of Insecticide Application in which he pointed out the possibilities of insect control with minute particles of DDT.

A motion picture entitled "Man, the Enigma" was shown by Glen H. Fisher at the Luncheon where the Lady Bugs were the Guests of Honor. At 2:00 p.m. the Lady Bugs left on their tour of the screwy "Winchester House" and the "Egyptian Museum." Mrs. Kay Baechler was their gracious hostess.

"Deep In The Heart of Texas"

Public health officials and PCO's, attending Houston Pest Control Association meeting, take time out from their rat-stoppage discussions for a photo. Pleased expresions indicate discussions have gone well.

Reading left to right—**Top row**: G. K. Edge, E. G. Wistrand, Miss Hearn, W. A. Kuehn, Mrs. W. A. Huehn, Mrs. B. L. Hearn, R. L. Parker, Guy Parker, H. T. Long, A. P. Bullard, Butler Long, Fell Mays.

2nd row: Mr. Krye, A. Bleiden, Mr. Miller, Mrs. Mary LaBorde, Henry Youngman, Mrs. Chuck Valentine, A. L. Brannan, Mrs. Tom Hardy, Chuck Valentine, Mrs. H. L. Belle, Mr. Bowman, Mrs. Bowman, A. J. Taylor, Dr. Austin F. Hill, Captain Hendrix, Captain Schliessman.

3rd row: Mrs. T. E. Franklin, T. E. Franklin, J. L. Howell, Tom Hardy, H. L. Belle, H. O. Abel, Otto Ritter, B. L. Hearn.

4th row: Bill Quinn, Mr. Cummings, Mr. Johnson, Mr. Franklin.

The Open Forum Discussion on Termites presided over by Ray V. Haneberg centered around the advisibility of doing termite work on 'time and material' or 'contract' basis. There was considerable discussion, some operators preferring one method but the majority indicated that their choice would depend on the specific job.

Dr. Earl W. Atkinson chose only one phase of office management as his topic, "Letter Writing." He advised to make your letter brief, friendly, specific, polite, accurate, frank, concise, modern, neat, logical sequence, with a minimum of "I's" and sign your name.

A Business Meeting was held by each organization. Fresno was chose as the next meeting place of both groups. Time: Oct. 5th or 12th..

The pre-dinner, dinner and after-dinner entertainment include refreshments, good eats, Albert J. Ruffo as dinner speaker and a swell 5-piece dance orchestra.

Those in attendance were:

Geo. G. Aitkenhead, N & T Chemical Co., San Francisco.

J. E. Baechler, Kabak Co., San Jose.

E. L. Barrett, Barret Pest Control, Berkeley.

Max Barrot, Max Barrot Ant Control, Palo Alto.

Paul A. Breck, Action Pest Control, Oakland.

Henry B. Butcher, B & B Termite Co., Menlo Park.

C. P. Cain, C. P. Cain Co., Fresno.

G. Darrel Cardiff, D. Darrel Cardiff, Santa Cruz.

James F. Clark, Clark Pest Control, Bakersfield.

C. L. Corson, Acteen Chemical Service, Berkeley.

E. O. Corson, Acteen Chemical Service, Berkeley.

Wayne K. Davis, Ailing House Termite Insp., Berkeley.

C. C. Delk, Delk Pest Control, Fresno.

C. H. Dry, Montgomery Pest Control, San Francisco.

G. H. Fisher, Paramount Pest Control, Oakland.

C. W. Haas, Russell Pest Control Co., Reno, Nevada.

Robert E. Hackley, Robert E. Hackley, Palo Alto.

Ray V. Haneberg, Farley's Termite Control, Oakland.

C. W. Hilliker, Hilliker Pest Control Co., Modesto.

J. W. Killinger, Jack the Ant Killer, Napa.

Nita A. Kelly, National Exterminators, San Francisco.

J. C. Kelly, J. J. Reid Co., San Francisco.

J. M. Kuehne, Rose Exterminator Co., San Francisco.

D. H. Little, Dried Fruit Ass'n of Calif., San Francisco.

Eric Livingston, Crane Chemical Co., San Francisco.

P. J. Merideth, P. J. Merideth, Palo Alto.

V. H. Montgomery, Montgomery Pest Control, San Francisco.

Elmer A. Roberts, Roberts Co., Burlingame.

Al Russell, Russell Pest Control Co., Reno, Nevada.

A. T. Parsons, Bay Pest Control Co., Burlingame.

Worried Tenant: "It's disgraceful. I'm sure two rats were fighting in my room last night."

Landlord: "So what do you expect to get for $3.00 a week? Bull fights?"

WHAT'S NEW IN PEST CONTROL-PERSONALS

BUILD A BETTER MOUSETRAP IS THE MORAL OF THIS STORY

Philadelphia—A huge rat, obviously angry at being caught in a mousetrap, was waiting for Louis Somershoe and his family today when they returned from a week end out of town.

The rat, with the trap clinging to one leg, chased Somershoe, his wife, and their two small sons onto tables and chairs.

Somershoe finally managed to telephone the police, who dispatched the rat with a riot stick.

PUBLISHES DDT BOOK

National Better Business Bureau, New York, has published a booklet called "Facts About DDT," which tells how to use safely insecticides containing the compound. Numerous precautions are listed, as well as effective methods of using DDT. The booklet is available from the bureau's headquarters, 405 Lexington Ave.

NEW RODENT POISONS—Dinitrocresol, dinitroalphanaphthol, and other nonsulphonated nitro dyestuffs are new members of the growing list of organic chemicals suggested as rodent poisons. They are said to be superior to barium carbonate, red squill, and thallium compounds, according to "Inside News."

ALL PARIS WRITHES

PARIS (AP).—A plague of fleas descended on Paris today, making life miserable in the subways, theatres, trains and other gathering places. Even in the Constituent Assembly, highest legislative chamber of the land, deputies fiddled with ties or jingled coins in their pockets in an attempt to hide their scratching. But the insects became so insistent the deputies finally resorted to open and above-board digging at their bites, which recognized no party lines. The plague hit the dignified opera last night, placing one star, in public view, in a painful spotlight where she could not withstand scratching. And her audience scratched with her.

Another interesting Associated Press release under date of May 21, 1946:

"Enough Grain—Rodent, Pest Insect Loss Rated High:—Washington, May 21 (AP)—There is more than enough grain in the world to feed all hungry people—except for mice, bugs and other pests.

A group of scientists reported to the United Nations Food and Agriculture organization today that rodents, insects, mice and fungi moulds destroy, after harvest, one-tenth of the 725,000,000 tons of cereals, peas, beans and oil seeds, produced each year.

Thus this year's estimated loss of 72,500,000 tons is more than seven times the 10,000,000 tons of wheat the world will be short this year.

Rodents alone will eat 25,000,000 tons and insects will destroy 36,250,000 tons, the scientists said.

In their recommendations they said handling methods must be "enormously improved," especially at the farmer-peasant level, to reduce losses."

Question: "A Bedford Hills, N. Y., listener asks: What other state besides Nevada uses lethal gas chambers?"

Answer: "Six other states use the lethal chamber for execution purposes—Arizona, California, Colorado, Mississippi, North Carolina and Oregon."

A. G. Bushouse of Kalamazoo, Michigan, reports being a proud grandfather. There was born of his daughter, Mrs. Arthur Meints, a bouncing 8-pound daughter who will bear the name of her mother, Eleanor Joyce. Congratulations to the parents and may the grandparents walk the floors many nights with the presently only grandchild.

The Mysterious Chemical Company, Inc., of New York City has moved to larger quarters in the Starrett Lehigh Building, 601 West 26th St. Much success.

Wedding Bells—Mr. and Mrs. J. Newman of Holyoke, Mass., announce the marriage of their daughter Dorothy to Paul Edward Gerhardt on Sunday afternoon, August 17th. The wedding ceremony took place at the Evangelical Lutheran Church in Holyoke and reception was held at Hotel Roger Smith. Our best wishes go with Dorothy and we congratulate Paul for having an accomplished fumigator.

FTC CASTS GLOOM ON THIS SUNSHINE

Sunshine Household Products Co., of Salt Lake City, makers of **Sunshine Foam**, have been charged by the Federal Trade Commission with misrepresenting the properties and effectiveness of the **Foam** as a mothproofing agent.

The FTC says that contrary to radio, newspaper, periodical and circular advertising, **Sunshine Foam** has no practical value, and is not dependable as a mothproofing agent. While **Sunshine Foam** might kill fabric pests thoroughly wet with the product at the time of applications, in doing this it would accomplish no more than would any so-called "contact" insecticide, the FCT complaint said.

THE HILL TERMITE CONTROL SYSTEM of Memphis Tenn., will have a booth exhibit at The Mortgage Bankers Ass'n of America Convention at The Netherlands Hotel, September 30, October 1st and 2nd, Cincinnati, Ohio.

Termite control operators in Cincinnati and surrounding cities who are interested in installing systems for new construction, will have the opportunity to see the new model of the system by paying a visit to the booth.

TWO OLD ESTABLISHED TERMITE CONTROL OPERATORS MERGE TO RENDER SUPER SERVICE

W. B. Hill of the Hill Termite Control Systems and M. W. Smith of the Jenkins Pest Control Co., Nashville, have formed a new termite control operating company to be known as the Hill-Smith Termite Control Company.

W. B. Hill has been identified with termite control operations for 18 years and M. W. Smith, a graduate entomologist of the Ohio State University, Columbus, Ohio, has

STANLEY'S PATENTED PIGEON-PROOFING

Economically, Permanently, Positively and **Lawfully** from any type of structure.

Stanley's Roofing & Building Service, Inc.

523 West 184th St. New York, N. Y.

Telephone: WAdsworth 7-3300-1

been in termite control work and general pest control for over 20 years in Memphis.

The Jenkins Pest Control Co. will continue to operate under the management and supervision of Mr. Smith in the general pest control field.

W. B. Hill, patentee of the Hill Termite Control Systems, a pipe sprinkler system for new constructions only, will devote part of his time to the national distribution of his patented system.

General offices of the three companies will be in the Messick Building.

Best Wishes.

DDT NO HELP: Dr. Der Van Karman of the California Institute of Technology, told of his surveying trip to Germany immediately after the surrender. He spoke to some underground workers who had been sent to Nazi labor camps. These workers discovered that laborers suffering from infectious diseases were released from the camps and isolated until cured. They could prove their need to be isolated by producing evidence of their sufferings. And the evidence was one louse . . . At the labor camps, therefore, arose a black market in lice. The established priced for one louse was a piece of bread plus three ration points. —From "The Lyons Den."

Termite Accident

The following incident was related by Jesse C. Bollinger of Exterminators Kill-All Co., Louisville, Ky.:

"I was serving on a jury in July trying four men and their employer for the death of a four-year-old girl.

"The men were taking out a 25-ft. long electric pole that was eaten by termites. The pole broke and fell, killing the little girl. The jury's verdict was considered as an accident."

When atomic power comes, says Dr. Farrington Daniels of the University of Chicago's now famous Metallurgical Laboratory, dumping radioactive materials down a sink may well become a punishable offense because sewage may be polluted. Even the air must be cleansed by hoods, filters and precipitators. A trapped rat may be a menace. Dr. Daniels assures us that it cannot be thrown even into an ordinary collection can or buried because a prowling animal may eat its radioactive carcass and because disintegrated radio elements with a life of centuries will persist in the ground.

TALL TALES OF THE SOUTH—Down in Arkansas this spring, a swarm of mosquitoes carried off a team of mules just as they were being hitched to the wagon. The share-cropper tried to catch the boss' mules. He climbed a tree to see what the mosquitoes did with the mules and when he looked down the road about a mile away, he saw he was just too late. The Arkansas mosquitoes had eaten the two mules and were pitching horseshoes to see who would get the harness.

DDT CRAYON—A DDT crayon, manufactured by National Products Co., of Orlando, Fla., is now being marketed. A line drawn with the crayon, it is stated, leaves a streak of DDT insecticide.

SUSPECT MOUSE-TRAPS TURNKEY—Baltimore, July 16—A police station turnkey was searching Joseph White, seventy-seven, arrested for disorderly conduct, when the turnkey suddenly yanked his hand out of the man's pocket—his fingers caught in a mousetrap. The trap was guarding three cents in White's pocket.

New Rodenticide Rings the Bell

Out on Long Island a greenhouse carnation grower hired a bell-ringer and saved his business. Here's the believe-it-or-not:

Mice, infesting the greenhouse, were chewing the carnation roots and stems. A holiday was only three weeks off, and no marketable blooms were being produced for the New York City market.

In desperation the grower appealed to the Department of Health of the big city. An inspector recommended a control. It was tried. It didn't work.

With two weeks left, the grower went back to first principles. Scare the mice, he reasoned, and they may stay in hiding. He hired a man and gave him a bell.

Night after night the man walked up and down the green house aisles ringing the bell.

The grower got his blooms.—AIF News.

BOOH—"If the war liquidated the summer theatre for the duration, by the way of compensation it provided it with a stimulant that should increase its popularity tenfold," writes Tallulah Bankhead, star of stage and screen, in the N. Y. Times. "For it's my contention that DDT, in its various solutions and sprays, will prove the greatest boon to the embowered stages since the invention of the counter-weight system. For while the actor may avoid poison ivy and other country violences if he remains indoors, he's never found a way to combat the savage mosquito and other vicious insect life. An actress isn't at her best when she has her mind on her welts rather than her words."

DDT IS DECRIED AS MEANS TO HALT POLIOMYELITIS

Two groups concerned with the incident of infantile paralysis depreciated on July 31 the value of DDT, the insecticide, as a method of controlling the disease.

One organization—the American Public Health Association—aserted in its monthly publication that there is no reason to believe that the dusting of DDT over a city from airplanes will have any measurable effect on the incidence of poliomyelitis.

The other group—the National Foundation for Infantile Paralysis—said that the foundation, on the basis of scientific evidence, "cannot advocate the use of DDT as an adequate method of controlling poliomyelitis."

NATIONAL SERVICE CHANGES IN WARTIME INSURANCE: In July 1945 the conversion period for the 5 year level premium term policies was extended to 8 years. In view of the war's termination in August similar policies issued January 1, 1946 and subsequently have a 5 year conversion period. On August 1 last further changes were made, these are: (1) New policies available (originally—Ordinary, 20, 30 pay life and 5 Year Term) 20 End., End. at 60 and 65; (2) All restrictions re beneficiaries have been removed; (3) Lump sum payments or equal monthly installments (36 to 240) are now available as well as original settlement options; (4) For an extra premium and qualification physically total disability benefits may be added to any National Service Life policy. Provides $5 per month per $1,000 of insurance as long as disability lasts—6 months considered permanent. Face amount of policy is not affected by such payments; (5) All persons who served in armed forces betwen 10-8-40 and 9-2-45 are entitled to file application for up to $10,000 maximum coverage—only requirement is a prescribed health standard; (6) Applications rejected for health reasons between dates specified in No. 5 are validated if applicant was killed or disabled in service; (7) Rate of interest charged on policy loans has been reduced from 5% to 4%. Information furnished through courtesy B. & D. A. Weisburger, N. Y.

DAVIDSON ADDED TO PENNSALT SALES STAFF

John M. Davidson, recently released from the United States Naval Air Force, has joined the sales staff of the Special Chemicals Division of the Pennsylvania Salt Manufacturing Company.

Mr. Davidson, a graduate of Dickinson College, served four years in the Navy. Before entering service he was a sales representative for the Ediphone Company and previously coached football and taught chemistry at the New York Military Academy.

Business Opportunities

(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 1200 Oak St., Kansas City 6, Mo., giving box number as well.

Wanted. Established pest control business. Eastern United States. Pennsylvania preferred. Will pay cash. Box 6. Pests.

NO POISON — NO BAIT

WIZO

RAT GLUE BOARDS

"Once they step on they never step off."

A practical and economical way to rid buildings of rodent pests! No hazards of poisoned bait . . . or of decomposition! Easy to prepare! Just place WIZO Rat Boards near rat hole or form a runway next to walls. Fasten boards to floor to prevent pulling away. Rodents are caught firmly the moment they step on the boards.

WIZO RAT GLUE can be obtained in quantities for preparing your own boards. Write for complete particulars.

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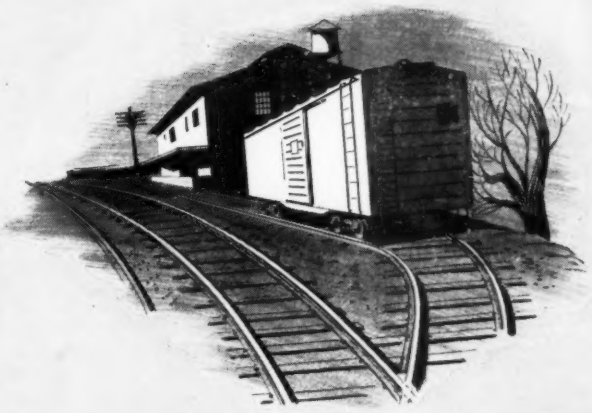
Case History*

BOX CAR FUMIGATION OF RICE

Rice Weevil, Confused Flour Beetle and Cadelle Succumb to Dow Methyl Bromide



*Actual record is on file at The Dow Chemical Company

Parked on a siding of a southern rice milling company, a boxcar was holding open house—for unwelcome visitors. It was loaded with rice which had become infested with rice weevil, confused flour beetle, and cadelle. Because the temperature ranged 40° F. and below, fumigation presented a major problem until Dow Methyl Bromide, suggested by an industrial fumigator, was used in the following manner:

Control Measures: Doors were sealed with greased kraft paper.

Dosage and Exposure Period: 24 pounds of Dow Methyl Bromide was used for a 24-hour exposure period.

Method of Application: Cold Methyl Bromide cooled in ice and salt was poured into eight shallow plans placed on top of the load.

Aeration Period: 2 hours.

Results: 24 hours after the fumigation was completed no signs of life could be detected and all evidence indicated a complete kill.

This outstanding job was possible because of Dow Methyl Bromide's ability to operate at very low temperatures. Undoubtedly, this effective fumigant can help you handle tough fumigation jobs. Why not write for further information?

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis
Houston • San Francisco • Los Angeles • Seattle

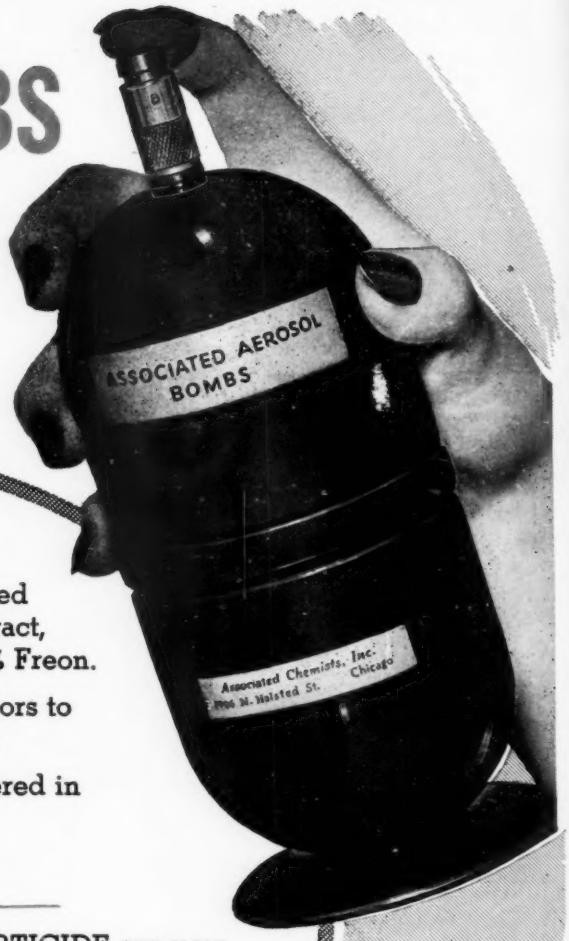
The penetrating fumigant

Methyl Bromide

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

AEROSOL BOMBS FOR RESALE



Filled with Standard Approved Insecticide—2% Pyrethrum Extract, 3% D.D.T., 10% Solvents and 85% Freon.

At prices which will enable Distributors to handle the bombs at attractive profits.

Supplied with Distributor's label if ordered in sufficient quantities.

Packed 24 to a Shipping Carton.

HI-TOX, MORTICIDE and SUPER-MORTICIDE are now obtainable with D.D.T. added. NO INCREASE IN OUR PRICES.

D.D.T. Solutions containing from 5% to 50% D.D.T. Technical Grade.

D.D.T. Powders with 10% to 50% D.D.T. Technical Grade.

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